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ABSTRACT

This paper presents the findings of a study that investigated whether members of culturally diverse populations could be more adequately represented in elementary gifted and talented programs through the use of a non-traditional assessment method. Teachers nominated students for gifted programs from multiple assessments and observations. The entire student population (n=199) was then assessed with a Multiple Intelligences (MI) assessment instrument. The demographics of the participants of the study represented high minority, high mobility, lower socioeconomic status students from fifth-grade classrooms in six Utah schools. Although the teachers were presented with materials on MI theory, the majority of their identifications were based on students' academic abilities in linguistics and logical-mathematics. The MI assessment instrument did not differentiate between gifted nominated children and non-nominated children; therefore, no inferences could be made about students' abilities. The study did show that classroom teachers are interested in identifying intelligences and degrees of expertise in students; however, they need proper training and appropriate assessment instruments in order to do so. The need for appropriately designed, intelligence fair, and culturally unbiased assessment to properly identify culturally diverse children and enhance equity is stressed. (Contains 48 references.) (Author/CR)

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AN INVESTIGATION OF THE PROBLEM OF IDENTIFICATION IN THE UNDER-REPRESENTATION OF CULTURALLY DIVERSE STUDENTS IN GIFTED AND TALENTED PROGRAMS IN UTAH SCHOOLS

ED 425 581

by

Valere McFarland

A project submitted in partial fulfillment
of the requirements for the degree

of

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who secretly loves my work.

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Abstract

Assessment instruments that limit children of any population group to linguistic, logical-mathematical and spatial teaching methods deny them an equitable learning experience. The purpose of this study was to find out whether members of a culturally diverse population could be more adequately represented in gifted and talented programs through the use of a non-traditional assessment method. Teachers nominated students for gifted and talented programs from multiple assessments and observations. The entire population was then assessed with a Multiple Intelligences (MI) assessment instrument. The demographics of the participants of the study represented high minority, high mobility, lower SES students from fifth-grade classrooms in six Utah schools. Although the teachers were presented with materials on MI theory, the majority of their identifications were based on students' academic abilities in linguistics and logical-mathematics. The MI assessment instrument did not differentiate between gifted nominated children and non-nominated children; therefore, no inferences could be made about students' abilities. The study did show that classroom teachers are interested in identifying intelligences and degrees of expertise in students; however they need proper training and appropriate assessment instruments in order to do so. Appropriately designed, intelligence fair and culturally unbiased assessments are one way to assist educators to properly identify culturally diverse children and thus enhance equity.

NATURE of the PROBLEM

The term culturally diverse, when combined with the term gifted, describes those gifted youth who, for cultural or socio-economic reasons, or both, have not had the advantages of other gifted children (Colangelo & Lafrenz, 1981). According to Colangelo and Lafrenz, whatever terms are used, two facts are indisputable: the term used should not imply better than or worse than and gifted/talented individuals are to be found in all groups. Passow (as cited in Colangelo & Lafrenz, 1981) stated that talent may lie untapped in some situations, under some conditions, but no population has either a monopoly on or any absence of talents.

The last two decades have witnessed an increased interest by educators in meeting the needs of gifted youngsters (Borland & Wright, 1994). The primary focus for the past forty years has been on identifying the cognitively gifted child, of the majority culture, who is gifted in mathematics and science. Today's interest in gifted students is focused considerably on identifying and meeting the needs of the culturally diverse gifted (Baldwin, 1987; Colangelo & Lafrenz, 1981; Maker, 1992, 1994; Richert, 1987; Roberts, 1989).

The body of literature which follows addresses: (a) the problem of defining giftedness; (b) traditional and non-traditional identification methods in gifted and talented programs; (c) identification of the gifted and talented in the culturally diverse population; (d) ethnic minority populations in gifted and talented programs; and (e) the effects of peer, family and societal values on the culturally diverse gifted and talented.

Defining Giftedness

Two important concepts of giftedness influence educators when discussing the definition of gifted students (Gallagher & Gallagher, 1994). One view is based on potential: whether the child will achieve outstanding school and life experience (Gallagher & Gallagher, 1994). The other view is based on performance. Definitions vary, from the general one proposed by Witty (as cited in Clark, 1988), which described gifted children as those whose performance is remarkable in any potentially valuable area, to more specific statements such as one given by the U.S. Commissioner of Education, S. Marland in 1972 (Gallagher & Gallagher, 1994). Marland's definition addressed the issues of performance and capability by the student and the responsibility for schools to establish programs for gifted students. These programs are necessary in order that the students will be able to realize their contribution to self and to society. Marland's definition has been adopted by most states and school districts throughout the nation and is now over twenty-five years old (Gallagher & Gallagher, 1994). According to Gallagher and Gallagher, Marland's definition affects the current attitudes administrators and teachers have toward gifted children. They stated that it does no good to find gifted children if we do not intend to do something distinctive about their education, therefore, we need to establish differentiated programs for them. In addition, their ability may not be showing itself well at the current time and needs to be discovered and stimulated. Finally, it is the hope of the education system that these children will contribute to

themselves and society. In other words, it is not simply the individual student that is of concern, but society as a whole (Gallagher & Gallagher, 1994).

The Consolidation and Improvement Act, passed by Congress in 1981, stated that gifted and talented children gave evidence of high performance capability in areas such as intellectual, creative, artistic, leadership capacity or specific academic fields and who require services not ordinarily provided by the schools (Clark, 1988). These definitions clearly define capabilities rather than past accomplishments or achievements, and they also state the necessity for the schools to provide special educational services (Clark, 1988; Gallagher & Gallagher, 1994).

A definition of giftedness, focusing on production, was given by Renzulli. He stated that giftedness consists of an interaction of above average ability, combined with high levels of creativity and task commitment (Clark, 1988). Gardner (1983) gave another expanded view on the concept of intelligence with the development of his theory of multiple intelligences. Gardner (1995) said that the theory of multiple intelligences (MI theory) was about the intellect, the human mind in its cognitive aspects. He developed the Theory of Multiple Intelligences in 1983 in which he states that all individuals are capable of at least seven different methods of processing information. The most recent version of Gardner's theory of multiple intelligences asserts that each individual possess at least eight relatively autonomous "intelligences": linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intra personal, and naturalist (the ability to draw on

aspects of the natural world to solve problems or fashion products) (Gardner in press, Kornhaber, 1997). Each individual possesses all eight intelligences but in different degrees.

Intelligences are "psychobiological potentials" which are available to all unimpaired human beings at birth to process different kinds of information (Gardner, 1983, 1995; Kornhaber, 1997). Over time, children's intelligences develop to process and to produce the forms of information (or "symbol systems") available in their intelligences in order to solve problems or to create products that are valued within one or more cultural settings (Kornhaber, 1997).

According to Gardner, creating culturally valued products and problem-solving occur within domains. Domains are any activities in which individuals participate on more than a casual basis and in which degrees of expertise can be identified and nurtured (Gardner, 1995). For example, in American culture, we could identify domains as car repair, marketing, ballet, rap, geometry, and journalism. By employing media and materials of these domains, diverse intelligences are developed and meaningfully assessed. By contrast, traditional testings in traditional school settings use primarily the linguistic and logical mathematical faculties (Gardner, 1991a). According to Gardner, a gifted youngster is one who advances quickly, who is "at promise" in an available task area or domain knowledge, due to strength(s) in his/her intelligences and to opportunities in the environment to develop them (Gardner, 1993a, p. 51).

He addressed seven domains, including linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal and intrapersonal. Gardner distinguished an *intelligence* from a *domain* as follows: an intelligence is a biological and psychological potential, while a domain is an organized set of activities within a culture, typically characterized by a specific symbol system (Gardner, 1995). He further states that a domain is "any cultural activity in which individuals participate on more than a casual basis and in which degrees of expertise can be identified and nurtured" (Gardner, 1995, p. 202). He stated that activities such as physics, chess, gardening, and rap music are domains in our Western culture (1995). According to Gardner, intelligence, or human intellectual competence, "must entail a set of skills of problem solving -- enabling the individual to resolve genuine problems or difficulties that he or she encounters and, when appropriate, to create an effective product -- and must also entail the potential for finding or creating problems -- thereby laying the groundwork for the acquisition of new knowledge" (1983, pp. 60-61). According to Maker (1992), Gardner's theory emphasized intellectual strengths important within a cultural context along with a recognition that the value of any particular competence will vary across cultural settings. Maker also stated that Gardner's theory integrated traditional concepts of intelligence (resolving genuine problems or difficulties, creating effective products) with traditional concepts of creativity (finding or creating problems, creating unique products). In addition, his theory included cultural context as an important component in the development and expression of competence.

This was an important element in the identification and development of giftedness in cultural, ethnic, and linguistic minority groups (Maker, 1992). Gardner (1995) emphasized the importance of taking seriously differences among human beings. He stated that if schools achieved giving students a more personalized education, the essence of multiple intelligences theory will have been embodied.

Identification Methods in Gifted and Talented Programs

Eligibility of students for admission to gifted and talented programs depends on the criterion used in identification. Although the criteria often includes performance capabilities, very few younger children have past performance indicators of giftedness. The older the child, the more likely that both potential and past experience are included in identification of program eligibility (Gallagher & Gallagher, 1994).

Traditional Identification Methods

Two of the most common methods which have traditionally been used to identify gifted children are teacher nominations and intelligence testing. Gallagher and Gallagher (1994) stated that the most common means of identifying gifted children in the first half of this century was through teacher nomination. However, according to Howley, Howley, and Pendarvis (1995), the process of teacher referrals often contributes to the practice of placing students in gifted programs on the basis of background characteristics other than ability. Clark (1988), also reported that teachers needed to be aware of the criteria they use in identifying gifted children. She stated that often the quiet, well-behaved, well-

dressed youngster who gets good grades is selected for gifted and talented programs. Pegnato and Birch (as cited in Clark, 1988) found that teachers most often select as gifted children who are like themselves. Whatever the teacher values will be the criterion for selection (Clark, 1988).

In a recent study, Howley et al. (1995) reported that schools seldom systematically refer all children with test scores or grade point averages above a given threshold. Because of this, teachers' referrals have become common, and referrals represent children in whom the teacher has taken a special interest. Subjective referrals of this sort have caused as many as half the children who would otherwise have scored in the gifted range on objective tests to be overlooked (Pegnato & Birch, as cited in Howley et al).

In addition, teachers may miss many more children in the early grades and kindergarten (Jacobs as cited in Clark, 1988; Howley et al., 1995) and even more minority students (Reid as cited in Howley et al.). Jacobs' study (as cited in Clark, 1988) found that parents could identify 76% of the gifted children in a kindergarten classroom, while the teacher's screening at that level only identified 4.3% Unfortunately, too few teachers know how to identify the characteristics of gifted learners. Gear (as cited in Clark) found that after completion of a five-session training program, teachers could be twice as effective in nominating gifted students for programs.

According to Gallagher and Gallagher (1994), another problem with the teacher referral process is the elimination of students who have a high aptitude for reasoning and

conceptualization, yet may not be performing well in school. Intelligence measurement has, up to now, been primarily conducted with paper and pencil tests (Clark, 1988).

Intelligence tests have been administered for approximately eighty years. The two most common intelligence quotient (IQ) tests are the Stanford-Binet and the Weschler Intelligence Scale for Children (Gallagher & Gallagher, 1994). However, there are several problems in using IQ tests exclusively for identifying gifted children. One assumption of most intelligence tests is that intelligence is a single, unvariable factor (Clark, 1988). Clark stated that although educators now know that intelligence is neither a single factor nor is it constant, measuring tools still proceed from previous beliefs. According to Golant (1991), an inherent problem is the use of a termination point for placement in a gifted program. Golant stated that a child's IQ score could be from 3 to 5.6 points higher or lower on any given testing day. If the eligibility requirement for a gifted program is an IQ of 132, and the child scores 128 on an IQ test, the child would not be admitted to the program. External factors such as physical illness or emotional problems on the day of the testing may have lowered the score.

An additional problem lies in the processing of information. According to Drews (as cited in Clark, 1988), gifted children do not necessarily amass and recall facts, which is one of the subtests on an IQ exam. Their talents lie in their ability to think about concepts involving great unitive themes. Drews (as cited in Clark, 1988) further stated that it is by this quality, more than by standardized tests, that creative and gifted children

can be identified, because they are able to determine the interrelations that lead to a higher synthesis. Measurements for reasoning and conceptualization are not available; however, tests for these criterion are currently being developed by researchers such as Sternberg, Gardner and Feldman (Clark, 1988). These researchers believe the new evaluations will be more sensitive to varying kinds of intelligence.

Nontraditional Identification Methods

Several researchers (Baldwin, 1987; Borland & Wright, 1994; Gallagher & Gallagher, 1994; Scott, Deul, Jean-Franciois, & Urbano, 1966) have recommended nontraditional methods for identifying gifted and talented students. Clark (1988), recommended using in-depth family histories, including historical and developmental data on the student, health and medical records of the student and family, and anecdotes of the student in the home that indicate unusual capacity and early development. In addition, she recommended an inventory to be supplied by the student, including values, interests and attitudes toward school and out-of-school activities. According to Clark, parents are some of the most helpful sources in identifying young children.

Identification of Gifted and Talented in the Culturally Diverse Population

Branscomb (as cited in Clark, 1988) reported that gifted children have one chance in twenty to be identified, the disadvantaged gifted child has one chance of 200. Torrance (as cited in Clark, 1988) found that testing culturally diverse children should include mood setting activities or providing activities that awaken the creative processes.

He stated that they should not have imposed time limits and that ways should be provided for the examiner to record the children's responses in order to elicit hidden verbal abilities.

Renzulli (as cited in Clark, 1988) suggested that we need to develop non-language-dependent identification strategies in order to find hidden abilities in the culturally diverse population. Renzulli also suggested that it was important to make the identification process a continuous one among the culturally diverse.

According to Tonemah (as cited in Clark, 1988), testing of culturally diverse children should also include performance based screening procedures. Tonemah stated that these procedures are essential for gifted or potentially gifted children from ethnic populations. Gardner (1995) also emphasized the value of performance based examinations. He stated that they were particularly valuable in foregrounding students' multiple intelligences.

Feldman (as cited in Maker, 1996) presented evidence that a major paradigm shift is occurring in the field of education for the gifted. This new paradigm has had particularly useful application for the culturally diverse gifted or potentially gifted student. Feldman suggested that the emerging paradigm is field-oriented rather than school-oriented and that identification is based on performance, rather than on tests. Although researchers, writers and other educators have expressed the need for a new gifted education model, a complete or universal shift has not yet occurred (Maker, 1996).

However, applications of performance based identifications are increasing and several examples of the concept of the recent paradigm shift follow.

Scott et al. (1996) used performance based assessment in a study conducted using 400 regular school children in Dade County, Florida. Their research showed that testing students, no matter the ethnicity, by using items universally familiar to all children, would identify gifted minority children.

A qualitative study by Borland and Wright (1994), in central Harlem, New York, identified young, potentially gifted, economically disadvantaged students through a series of non-traditional performance based activities. Their nontraditional identification procedures included using multi-cultural curriculum-based enrichment activities, classroom observations, portfolio assessment, peer nominations, parental assessment and student interviews. They also used dynamic matrix assessment in order to determine what the student knew and could do along with what the student could do with a little instruction. Their traditional assessment methods included standardized testing and teacher nominations. Although this study was time and labor intensive, the researchers determined that it was successful because of its involvement with the issue of equity in identification. These researchers also concluded that it was possible to discover giftedness in every school.

Another assessment process which fit within this new paradigm was developed by Maker (1996) and colleagues. This process, Discovering Intellectual Strengths and

Capabilities through Observing while allowing for Varied Ethnic Responses (DISCOVER), used tasks in the areas of linguistics, logical-mathematical and spatial intelligences, and was developed for grades kindergarten through twelve. According to Maker, an outcome of the DISCOVER assessment, which involved the culturally diverse gifted, is that some teachers immediately changed their perceptions of students' abilities after watching them. Students who had not previously been identified as gifted because their abilities were nonverbal were recognized as gifted when working on projects in the DISCOVER model.

The DISCOVER model involved assessment, curriculum development and program evaluation based on Gardner's (1983) Theory of Multiple Intelligences, Maker's definition of giftedness and the integration of culturally relevant, rich learning experiences (Maker, 1995). The program's children were diverse in many ways: some lived on remote reservations, others lived in high crime rate areas of a mid-sized city, and others lived on the Mexican-American border. Their cultures consisted of Native American, Mexican, African-American, Laotian, Japanese, Chinese, Yaqui and Northern European. Their languages represented all of these groups, as well as combinations of languages of these groups. Most of the children were from lower socio-economic levels (Maker, 1995).

By using the DISCOVER Assessment process, Maker and colleagues identified children who were gifted in all of Gardner's seven intelligences: linguistic, logical-

mathematical, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal. She found that all combinations were possible, however, very few children were gifted in more than five of the seven different ways. Some were gifted in three to five areas; however, most were gifted in one or two areas (Maker, 1995).

According to Maker, Nielson and Rogers (1994), while Gardner's ideas constituted a useful theoretical framework, specific applications were needed if the framework was to be practical in an educational setting. Maker and Schiever (as cited in Maker et al., 1994) created a problem solving matrix for designing assessment procedures and developing curriculum, which they used in the DISCOVER assessment process. This matrix, which was based on multiple intelligences defined by Gardner (1983) and the continuum of problem types defined by Getzels and Czikszentmihalyi (as cited in Maker et al., 1992), incorporates the facets of a personalized education. The matrix also is used in curriculum planning processes. According to Maker et al., the process modifications of higher-level thinking, open endedness, discovery, freedom of choice, group interaction, pacing, and variety are inherent in the matrix design. All of these processes encourage independence and promote autonomy.

The students' use of multiple intelligences result in products which contain unique solutions to problems (Maker et. al., 1994). The use of the matrix leads to independent study through student designed curriculum (1994). One of the most important goals of Maker's programs is to increase the individual learner's control of the learning process,

which in turn increases opportunities for decision making in learning and living situations (Maker et. al). According to Ruiz (as cited in Maker et al.), by increasing students' options, they are less likely to give up in problem solving or learning tasks.

Maker et al. (1994) stated that the essence of the DISCOVER assessment process is that children engage in problem solving activities in their regular classroom setting. These activities are designed to identify spatial, logical-mathematical/spatial, logical-mathematical, linguistic, interpersonal and intrapersonal abilities. Maker et al. further stated that future assessments will include musical and bodily-kinesthetic problem solving activities.

According to Kornhaber (1997), in order to properly incorporate Multiple Intelligences Theory into curriculum, assessment and pedagogy, three MI specific conditions need to be met. These three conditions are that the assessment extends beyond the three abilities that are traditionally measured (i.e , linguistic, logical-mathematical, and spatial); the assessment should be intelligence fair; and the assessments should be domain based. Kornhaber also suggested five general conditions useful to incorporate in assessments drawing on MI in order to make the identification process publicly defensible. These conditions are: "students understand the task, they are encouraged to do their best work; the observers are adequately trained; there are clear scoring procedures; the observers' judgments are reliable" (1997, p. 278). According to Kornhaber, "built-in, unavoidable and public sources of critical feedback" are necessary in

order to ensure that the assessment process is as technically sound as possible (1997, p. 278). Another necessary feature is the involvement of a group of schools or a district, rather than one or two schools. Among the reasons given for the necessity of this inclusion is that the program is likely to receive more attention when more students and parents are affected. Another critical factor, according to Kornhaber, was related to the nature of the benefit to the school. For instance, was the work the result of a single person, i.e., a principal who was involved in the work, was it caused by a Hawthorne effect, or to some other cause? Kornhaber found that the DISCOVER program was lacking in the area of critical feedback and the number of schools involved in the project. According to Kornhaber, although DISCOVER was intelligence fair, it did not meet three of the five necessary general conditions necessary to make inferences about individual's abilities from any assessment: necessary training of evaluators, clear scoring procedures and observer reliability. Children did understand tasks and were encouraged to do their best work. Two additional conditions necessary to link the assessment to Multiple Intelligences Theory were also not met: that the process assesses abilities beyond traditional tests and that the process be domain-based. Kornhaber concluded that observers' reliability had not been established with the DISCOVER process, "despite suggestions to the contrary" (e.g., Griffiths, n.d.; Nielson, personal communication, February 18, 1997 as cited in Kornhaber, 1997, p. 235). In summation, Kornhaber's research found that DISCOVER, at this time, needs more observer training and clearer

scoring procedures in order to achieve observer reliability. However, she found that "by meeting the intelligence-fair condition, youngsters who might otherwise go undetected, get noticed. As teachers in classrooms begin to see children differently and come to appreciate that children may have an array of strengths, they become more likely to provide opportunities that would engage and develop these youngsters' abilities" (Kornhaber, 1997, p. 244).

The need for assessment instruments which could examine the dominant intelligences of students in pre-schools, elementary and secondary schools, community colleges, and universities has led to the development of the Teele Inventory of Multiple Intelligences (TIMI) (personal communication, Kornhaber, January 16, 1998; Teele, 1997). TIMI does not meet the criteria set by Kornhaber (1997) because it is not observer based, nor are students encouraged to do their best work. According to the developer, the TIMI is not designed to measure intelligences nor to designate a child as gifted. The TIMI simply shows the most dominant intelligence on the day the research was conducted. Furthermore, this intelligence has been shown to change, based on what occurs on the test day. However, students have one or two intelligences which remain dominant, which is backed up by her test-retest statistical analyses (S. Teele, personal communication, February 2, 1998). Although Gardner has now (Kornhaber, 1997) identified eight intelligences, the TIMI addresses seven of these: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, and intra personal. In

studies conducted by Teele in over 650 schools from 1992 to 1998, these seven dominant intelligences were assessed. This data was used to determine whether there are different dominant intelligences at different grade levels (Teele, 1997). Teele found indications that, "developmentally, students may have different dominant intelligences at different grade levels no matter where they live or go to school" (1997, p. 32).

Teele states that identification of intelligences can assist in providing an educational system that enables all students to achieve at a pace they can handle, assure them positive reinforcement and allow them to reach their fullest potential. Teele also said that methodologies should be implemented that reach all students and honor their diversity. This inventory will assist teachers in identifying their students' dominant intelligences in order to assist them in providing methodologies that reach all seven intelligences (Teele, 1997).

Cultural and Societal Attitudes - Effects on Minorities

In addition to improper identification methods, cultural and societal attitudes can result in under-representation of ethnic minorities in gifted and talented programs. According to Colangelo and Lafrenz (1981), three environmental influences affect culturally diverse gifted students. These influences are peer and community values, family values and school or majority culture values.

Effects of Peer/Community Values

While peer influences have an impact on all youngsters, there are unique instances in the case of the culturally diverse gifted student. In their study, Colangelo and Lafrenz (1981) found that culturally diverse gifted students were often pressured by nongifted culturally diverse peers to not perform well in white schools. Colangelo and Lafrenz stated that this kind of achievement or performance by the culturally diverse gifted can be looked at by their peers as having the effect of turning their backs on their own community.

Effects of Home/Family Values

Pressey (as cited in Clark, 1988), said that encouragement from family and friends were important factors in developing genius. Other investigators have validated and extended Pressey's work. Bloom reported that giftedness and high levels of talent are created (as cited in Clark, 1988). Bloom interviewed individuals who had attained world class status in a variety of fields. He concluded that parents, teachers and environments were major determiners in their children's achievement of success.

Clark (1988), reported three characteristics necessary to achieve at high levels. These traits, which appeared to emerge from the early socialization and attitudes in the home, are: unusual willingness to do great amounts of work, a determination to do one's best at all costs, and the ability to learn rapidly. While giftedness is looked upon as a positive attribute in many majority culture homes, it is not always the case in ethnic or

culturally diverse homes. Shade (as cited in Clasen, Middleton, & Connell, 1994) stated that many African-American students and their parents do not find the term *gifted* relevant in their culture and resist or refuse participation in gifted programs.

Differences between attitudes, values and behavior of parents of young gifted and nongifted children were compared in a study conducted by Karnes, Shwedel, and Steinberg (1984). According to Karnes et al., parents of the gifted children engaged in school-related activities six times more frequently than the parents of the nongifted. Parents of gifted students read to their children three times longer each day, encouraged language development, encouraged freedom, and exposed their children to a variety of experiences, including museums, nature walks, and natural history museums.

In another study, Karnes and Shwedel (as cited in Clark, 1988) noted differences in attitude and practices between fathers of young gifted children and fathers of young nongifted children. These authors found that fathers of gifted children demonstrated longer and more frequent instances of involvement with their children. In addition to reading, fathers of gifted children placed emphasis on fine motor development and oral language, while fathers of nongifted children emphasized physical activities. Fathers of gifted children encouraged their children's unusual questions and encouraged independence.

Parental expectations of Hispanic parents were discussed in a study by Strom and Johnson (1989). Strom and Johnson suggested that in order for Hispanic parents to

support their potentially gifted children in existing gifted and talented programs, they needed to emphasize growth in encouraging the development and practice of decision making skills. The results of this study permitted the authors to develop a differentiated curriculum to fit the needs of people from diverse backgrounds.

Borland and Wright (1994), stated that although parents have knowledge about children to which no one else is privy, obtaining this knowledge can be difficult. They stated that obtaining this knowledge is difficult because some parents are illiterate, limited in English proficiency, suspicious of school personnel, or absent from the home. Other problems include the parents' use of drugs and/or alcohol, their illegal immigration status, or other difficulties that limit their ability and willingness to cooperate with school authorities. In order to overcome some of these barriers, Borland and Wright worked with parents by having teachers send home letters to parents. The parents were asked to contribute information reflecting their children's abilities or interests for their children's portfolios. According to the researchers, this process established communication with parents and helped to identify culturally diverse students.

Other cultural attributes negatively impact gifted students. A large number of Asian-American students have difficulties in dealing with negative feelings of not being able to meet their parents' expectations. According to Tidwell (as cited in Shen, 1990), this is particularly true for gifted Asian-American children. Tidwell reported that these

children showed a disturbing pattern of generally lower levels of self-esteem than White and African-American children.

Impacts of Majority Culture Values on Schools and Teachers

Many researchers have discussed the failure of educators to identify as gifted students from minority ethnic and racial groups and from the working class for placement (Darder, 1991; Howley et al., 1995; Reis, 1987). Darder (1991) claimed that this was the result of the *hidden curriculum* in schools. Aronowitz and Giroux (as cited in Darder, 1991) described this hidden curriculum as the way in which school curricula often ignores the histories of women, racial minorities and the working class. A particular problem in this lack of sensitivity by educators to curriculum content, according to Darder, is in the area of language domination, because it silences the possible development of the student's voice. Darder gave as an example, the history of Native American Indian children, who have been forced to leave their families and their cultural communities on reservations to attend government schools. The following sections include case examples and case studies of ways in which the values of the majority culture impact teachers and schools.

Impact of Majority Culture on Teacher Behavior

Researchers have shown that teachers are an important factor in impacting gifted and talented traits (Clark, 1988; Gallagher & Gallagher, 1994; Kitano, 1986). Keddie (as cited in Darder, 1991) illustrated how the *hidden curriculum* affected teachers' attitudes. Keddie stated that working-class students were taught to follow rules which resulted in

their not asking questions or raising issues that challenged teacher assumptions. Keddie reported that teachers' attitudes toward middle class students were different. These students were offered complex material and class participation was encouraged, rather than discouraged.

Baldwin (1987) listed the following as important teacher behaviors in working with and identifying gifted children. She stated that it is important that teachers understand and have tolerance for behavioral characteristics which don't fit the usual conception of giftedness. Baldwin also said that teachers must play a leadership role in developing harmony and acceptance among all children in the classroom. In addition, the teacher must plan with the students to set criteria for cognitive and non-cognitive behaviors. In the case of the African-American child, the evaluation must be primarily formative. This will give the teacher a chance to adjust or alter procedures to meet the needs of the African-American child. The evaluation should not simply be grades, but a combination of behaviors. Finally, it is important that the children contribute to the evaluation process (1987).

In addition to teacher behaviors within the classroom, educators (Baldwin, 1987; Betts, 1985; Clark, 1988) advocated the use of role models and mentors for teaching culturally diverse gifted students. Frasier and McCannon (as cited in Baldwin, 1987) recommended the use of bibliotherapy, which involved children in reading about characters like themselves in race and socioeconomic levels, who have made major

accomplishments. Frasier (as cited in Colangelo, 1981) also advised the use of mentors in working with diverse gifted youth. Frasier suggested that mentors tutor the gifted and encourage questioning attitudes from them. Betts (1985) developed a strong component of mentorship in his Autonomous Learner Model which was developed for high school students. According to Clark (1988), Betts' model is particularly useful in helping culturally diverse youngsters meet their social-emotional needs because it stresses developing independence in the learning setting.

Clasen et al. (1994) investigated nontraditional assessments for their efficacy in identifying both minority and nonminority students for entry into gifted programs. Peer and teacher nominations were used in identification. The problem solving tasks used contextual problems that drew upon real experiences and backgrounds of the students. By using the nontraditional identification methods, Clasen et al. identified a proportionate number of minority and nonminority students with potential in art or problem solving. Peer nominations supported art and problem solving identifications, which identified a majority of minority males. Although 58% of the minority males were identified by independent scorers, who were art teachers from other districts, none of these students were nominated by their own teachers for inclusion. According to the researchers, this may suggest that teachers are unaware of or do not value talents identified by these tasks. The authors concluded that nontraditional assessments should not replace more traditional methods, but rather, they should act as complementary measures in an

inclusionary identification model. A study conducted by Clark and Zimmerman (1992) confirmed this view. They said that students from diverse backgrounds, including minority students from economically disadvantaged groups, usually are under-represented in gifted and talented programs. Clark and Zimmerman also said that students differ in ways including interest, learning styles, rates of learning, motivation, work habits and personalities. According to the researchers, it is characteristics such as these that are most often ignored.

Strom (as cited in Clasen et al., 1994) stated that teacher expectations play a major role in identifying gifted students and that teacher expectations for many minority students are low, regardless of students' abilities. Escalente and Dirman (as cited in Clasen, et al.) found that when teacher expectations are high and when the students are appropriately challenged, abilities are more likely to emerge.

According to Howley et al. (1995), many teachers believe that learning deficiencies and behavior disorders are inherited brain dysfunctions when evidence of neurological impairment is lacking. Thus, curriculum and instruction are regarded as less essential than innate ability for the development of talent. This emphasis, according to the authors, was likely to have particularly damaging effects on the achievement of gifted students from economically disadvantaged homes. Howley and colleagues stated that disadvantaged families of gifted students often lack the resources to compensate for the schools' neglect.

Impact of Majority Culture Values on Schools

The majority culture also has an impact on the equitable identification of culturally diverse gifted or potentially gifted students. Gallagher and Gallagher (1994) reported that in African-American populations, although high ability girls outnumber boys more than two to one, more boys than girls are found in searches for gifted and talented students. They stated that the lack of opportunities available for African-American boys compared to those available for African-American girls could lead to the speculation that perceived opportunities in adult society affects the full realization of intellectual potential for children. The same reasoning could be applied to the reason why there are more gifted boys than gifted girls in the general population. Gallagher and Gallagher stated that the failure of schools to develop African-American, or Hispanic, or Native-American potential can be seen as part of a general failure of the culture to provide opportunities and academic incentives.

Howley et al. (1995) stated that the Gifted and Talented Children and Youth Education Act of 1985 identified economically disadvantaged and minority children as being underserved and established these groups as one of the highest priorities for the use of federal funds under that act. However, Gintis and Bowles (as cited in Howley et al.) said that the effects of spending more money are not likely to be great, because economic and culture structures limit the attainment of these groups in society. Howley et al. recommended that acceleration and advanced classes be provided for gifted as well as

other students who could benefit from such classes. To Howley et al., this merely makes economic sense: by providing acceleration, gifted children would proceed through the system more rapidly and the funds that otherwise would be spent (largely for custody alone) could be diverted to better purposes. They cautioned that accelerated and advanced classes should represent the equal participation of both genders, as well as locally represented ethnic groups and underprivileged students.

Ethnic Minority Representation in Population

Passow (as cited in Colangelo & Lafrenz, 1981), said that talent comes from all ethnic groups, social classes and residential areas and that no population has either a monopoly on or any absence of talents. Although the ethnic minority population in our public schools is increasing rapidly, the numbers of ethnic minority referrals to gifted and talented programs has not increased proportionately. According to the 1990 Census Report, in 1900, four out of five foreign-born people in the United States were born in European countries. Today, only one in five is of European origin (Maker, 1996). The 1994 Elementary and Secondary School Civil Rights Compliance Report indicated that ethnic minorities represented 34.32 percent of the school population, while only 19.72 percent of these ethnic minorities were enrolled in gifted and talented programs. In a 1992 report commissioned by the National Research Center on the Gifted and Talented, Clark and Zimmerman found that minority and economically disadvantaged students from diverse backgrounds are most often under-represented in gifted and talented programs.

Maker (1996), found that some of the greatest increases of minority populations in schools have occurred in the Southwest, where many school districts have enrollments of 60 percent to 95 percent Hispanic children. Despite this increase, there has not been a matching increase of ethnic minorities in gifted and talented programs. Maker also identified an urban district in the Southeast with an 81 percent African-American and Hispanic student population, which had only an identified 50 percent African-American or Hispanic student gifted population (1996). Maker suggested that while there have been important changes in perceptions, needs and population with regards to minority involvement in gifted programs, many educators continue to rely on instruments designed to measure giftedness as it was perceived early in this century (Maker, 1996). According to Maker, these out-moded instruments affect both minority and nonminority populations (1996).

Borland and Wright (1994) also suggested that the problem in under-representation of minorities was in the process of identification. Their view is that culturally diverse children face serious impediments to success in a society that is in many respects racist and has what some (e.g., Ogbu, 1978, 1992, as cited in Borland & Wright, 1994) call a caste system. Jensen (as cited in Borland and Wright, 1994) stated that gaps exist between the mean IQs of African-American and Caucasian children and attempts to overcome this discrepancy have not been successful. Unsuccessful procedures that have

been used to adjust the discrepancies caused by gaps between IQ scores have included the use of matrices or culture free tests (Borland & Wright, 1994).

As Howley et al. (1995) have explained, the principle on which multiple criteria could support eligibility is negated by the matrix approach. Where multiple criteria exist, they are used as cumulative hurdles, rather than alternatives.

Under Representation of Ethnic Minorities in Gifted and Talented Programs

The failure of intelligence and achievement tests, once thought to predict which children could become successful contributors to society, has been widely recognized (Maker, 1996). According to Renzulli, research "clearly indicates that vast numbers and proportions of our society's most productive persons are not those who scored at the 95th+ percentile on standardized tests..." (as cited in Maker, 1996, p. 42). According to Maker (1996), these tests not only do not predict success in nonacademic settings, they are also poor predictors of success in academic settings. She also stated that the use of intelligence tests as presently constructed and normed does not result in an equitable distribution of ethnic, cultural, and linguistic minority groups in special education programs. Although many researchers (e.g. Howley et al., 1995; Maker, 1996; Sapon-Shevin, 1993) have called for a paradigm shift in identification procedures, this change has not occurred. Maker posited that "the problem could be simply stated as this: either the recommended procedures are not being used or they are being used, but are not working. In either case, changes need to occur" (1996, p. 42).

Gardner (1993a) stated that the concept of IQ with unitary views of intelligence needs to be challenged and replaced. According to Gardner, "we should get away altogether from tests and correlations among tests, and look instead at more naturalistic sources of information about how peoples around the world develop skills important to their way of life" (1993a, p. 7). He proposed using intelligence fair instruments which would allow educators to try to understand "as sensitively and comprehensively as possible the abilities and interests of the students in a school" (1993a, p. 10). According to Gardner (1991a), children should be assessed by observing them on many occasions over time as they are engaged in domain-relevant tasks.

PURPOSE and OBJECTIVES

The literature reviewed identified the importance of the roles of the family, community and school in the identification and education of gifted culturally diverse children. Although generalizations cannot be made about all ethnic minority children or culturally diverse children, the literature showed that there were variables that might intervene in their chances of obtaining an equitable education. Variables which may enhance the educational process for culturally diverse gifted or potentially gifted children do exist. It is important for educators to understand and work with the variables that have been identified in order to ensure that all children have an equitable education. There is a need for families, communities and educators to understand, work with, and develop the large pool of gifted or potentially gifted culturally diverse children in our population.

The purpose of this research project was to identify potentially gifted, culturally diverse students. The major issue to be addressed by this pilot study was whether there was an under-representation of culturally diverse gifted students in our schools' gifted and talented programs in elementary schools in Ogden and Jordan School Districts in Utah.

The purpose of this study was not to suggest that there was a need for a distinct and totally different program which should have been designed for culturally diverse gifted students. It was intended to show the importance of identification, curriculum planning, and evaluation to the culturally diverse student. These facets of a gifted program need to

be recognized in order to enhance the abilities of the culturally diverse gifted students and to ensure their achievement of their highest potential in society.

Research Questions

The project was designed to identify the referral/testing/application process currently being used in gifted and talented programs in two Utah school districts. In addition, the study determined whether a modified referral system (the TIMI assessment process) would result in increased placement of culturally diverse students in gifted and talented programs. Specifically, were members of the culturally diverse population adequately represented in the numbers of referrals for testing and placement in gifted and talented programs? The study will examined three questions related to demographics:

1. From the number of students referred and subsequently screened for services, what was the total number of students actually receiving services?

2. From the total number receiving services, how many of that number were culturally diverse students?

3. Would a modified referral system (the TIMI assessment process) increase the potential for the placement of culturally diverse students in gifted and talented programs?

Operational Definitions

This study used the term culturally diverse to include ethnic minorities, females, handicapped, underachieving and the economically deprived. The application processes

for the Jordan and Ogden School Districts were defined and included in Appendix P. Utah State guidelines are included in Appendix O. Gifted and talented definitions by Marland, Renzulli, and Gardner were included in Appendix B. Gardner's theory of multiple intelligences and definition of intelligence was also included in Appendix B. Traditional referral systems are methods of identification which include such practices as using standardized testing or teacher referrals. Non-traditional methods include the use of peer, self, and parent referrals, as well as performance based assessment activities. Non-traditional methods are included in modified referral systems. A description of modified referral systems will be listed in Appendix C.

METHODOLOGY: PROCEDURES

Data Source

The data analyzed for this study was obtained from an investigation of the identification processes used in gifted and talented programs in two school districts in northern Utah. The observations were obtained as a result of quantitative and qualitative research obtained from a pilot study conducted in six elementary schools. The dependent variable was the currently existing number of referrals of culturally diverse gifted or potentially gifted students to gifted and talented programs in Ogden School District and in Jordan School District. The research results were compared with the dependent variable to find out whether a non-traditional identification method (the TIMI assessment process) would increase the number of referrals of culturally diverse gifted or potentially gifted students to gifted and talented programs in Ogden and Jordan School Districts. The observations in the study were collected in the early spring of 1998. The proposed sampling and instrumentation are described below.

School Sample

Subjects in the study were classroom students and mainstream teachers, from six elementary schools in two school districts: Ogden School District and Jordan School District. These sites were purposely chosen because of their similar demographics. The Ogden School District had a 34% minority population. The two schools tested in Ogden

School District had 70.48% and 85.9% minority populations. The schools tested within the Jordan School District had a 31.5% (average) minority population.

Student Sample

One hundred ninety-nine (199) students were used in the analyses. Students from fifth grade classes from two elementary schools in Ogden School District and four elementary schools in Jordan School District were observed.

Data Collection

The pilot study was conducted in two phases. Phase 1 of the pilot study consisted of collecting nomination forms for traditionally based nominations of gifted students from regular classroom teachers.

Phase 2 of the pilot study involved performing assessments using the TIMI assessment process during typical classroom periods. The TIMI assessment was a forced choice pictorial inventory that contained fifty-six numbered pictures of panda bears representing characteristics of each of seven intelligences and provided students twenty-eight opportunities to make their selections of two choices. The different intelligences were matched with one another and students had eight different times they could select each of the seven intelligences. Therefore, the maximum possible points for each intelligence was eight (Teele, 1997).

Materials

The materials used in Phase 2 of the assessment were a workbook and an answer sheet which were given to each participant. A Teacher's Manual, containing verbatim instructions to be read to the participants, was used by the researcher. A transparency sheet was used to score the answer sheets. The TIMI assessment workbook contained fourteen pages with fifty-six numbered pictures of panda bears in activities representing characteristics of each of the seven intelligences (Teele, 1992).

Assessment Training

The administration of the Teele Inventory of Multiple Intelligences (TIMI) required no special preparation other than a familiarity with the inventory materials.

Instrumentation

Nomination Form

The nomination form used in Phase 1 of the pilot study included the following information: title of the referring individual(s), gender, school, and number of years in the teaching profession. This form will also include the student's identification number, gender, ethnicity, economic status, social class and grade in school. Other demographic information included the student(s)' interests, learning styles, rates of learning, motivation, work habits and personalities. A copy of this form has been included in Appendix G.

TIMI Assessment Process

The Teele Inventory of Multiple Intelligences (TIMI) was a forced choice inventory (Teele, 1992). It was important that the individuals who took this inventory selected one of the two choices that was most like them. Because it was designed as a forced choice inventory, they needed to always select one of the two pictures. The TIMI assessment process, developed by Teele (1992), used Gardner's theory of multiple intelligences as the overall conceptual framework. The TIMI instrument was selected for use because it was purported to identify students' dominant intelligences. According to the developer, TIMI has been proven to be reliable through test-retest studies (Teele, 1992). Because the test was based on Gardner's Theory of Multiple Intelligences and designed to measure the dominance of intelligences in students, we would expect it to differentiate between students nominated for gifted programs (GNOM) and non-nominated students (NNOM), and we would expect the GNOM students to perform better than the NNOM students. Based on the fact that nominations of students for gifted and talented programs are usually the result of teacher observations of students' academic performance in linguistic and logical-mathematics, or the result of high test scores in these academic areas, it was expected that GNOM students would have strengths or dominant intelligences in those areas. The TIMI assessment process is described in the following paragraphs.

The Identification Process. The TIMI assessment process was implemented in a regular classroom setting. To increase the authenticity of the TIMI process in identifying the strengths of students in school settings, the inventory was given in a relaxed environment that allowed individuals to carefully make a forced choice selection. No teacher training was required because the assessment process was conducted by the researcher. Prior to the day of the assessment, the regular classroom teacher was given a prepared hand-out giving an overview of the TIMI assessment process as well as a description of multiple intelligences theory. The teacher was given the hand-out in an in-service training session if possible, or the hand-out was be mailed if the teacher was not available for a training session. A copy of the hand-out is attached as Appendix E. Each of the school principals were mailed or given hand-carried packages containing the instructions for teachers, as well as the parental consent forms in Spanish and English. Teachers gave each child a parental consent form which was signed by the parent or guardian and returned prior to the TIMI assessment process. The parental consent form was translated into Spanish for Spanish speaking parents/care givers. A copy of the English version of the parental consent form is included in Appendix H. A copy of the Spanish version of the parental consent form is included in Appendix I.

Context. To increase the authenticity of the TIMI process in identifying the strengths of students in school settings, the inventory was given in a relaxed environment that allowed individuals to carefully make a forced choice selection (Teele, 1992). To motivate the

participant to do his or her best, the participants were told that there were no right or wrong answers; the inventory simply identified the strengths or dominant intelligences each participant possessed (Teele, 1992).

Administration of TIMI. Directions to the participants were read verbatim, rather than given from memory in order to provide continuity. No assistance was given participants in making their selections unless they did not understand the picture(s). In the case participants did not understand the picture(s), a careful and objective description was given of the picture. The subjects took any reasonable amount of time per item to make their selection. However, participants were encouraged to choose one of the two choices (Teele, 1992).

Scoring the Inventory. When scoring the inventory, the transparency sheet was placed over the responses on the answer sheet. Marks were recorded in the appropriate boxes below the answer sheet for each of the responses. When all twenty-eight responses had been recorded, a tally was made for the responses in each of the seven intelligences. Based on the number of responses given, the total scores of the intelligences were recorded in the appropriate lines.

Procedures

In-Service Training and Nomination Process. The study was conducted in two phases. The first phase consisted of in-service training of the teachers by the researcher on identification criteria for gifted and talented students, the Teale Inventory for Multiple

Intelligences (TIMI) and on Multiple Intelligences Theory. The researcher recorded conversations with the teachers regarding their perceptions of children in the classroom; i.e., whether they felt that they had gifted children currently in their classrooms. The researcher also recorded comments about any prior knowledge the teachers had about Multiple Intelligences Theory. This phase of the study also included collecting nominations of gifted students which were made by classroom teachers. The nomination process was implemented prior to the actual assessment process. This was necessary in order to make an unbiased nomination which was not affected by the results of the TIMI assessment. The teacher was asked to fill out the nomination form recommending students from the class whom he/she felt would be accepted into a gifted and talented program. These nominations were made on nomination forms supplied by the researcher. Guidelines for nominating students were not specified; however, a list of characteristics of gifted students was given to each classroom teacher, in order to assist the teacher with the nomination process (Clark, 1988). This form is attached as Appendix F, and was to be used only as a guide in assisting teachers who may have been unfamiliar with characteristics of gifted children. Teachers were encouraged to review other lists of gifted characteristics by other researchers. The classroom teachers were requested to fill in the student identification number of the student(s) they were nominating. The classroom teachers included on the nomination form, the student's gender, ethnicity, economic status, and grade in school. Other demographic information included on the form was

the student's interests, learning styles, rates of learning, motivation, work habits and personality. In addition, the classroom teachers stated their reason(s) for nominating the student. The teacher also identified the method(s) used in identifying the student, i.e., whether the nomination was made as a result of standardized test results, observations, or any other format, such as a non-traditional method. The classroom teachers identified themselves by school, gender and number of years in the teaching profession. The total classroom population by gender and ethnicity was also included on the nomination form. When the nominations were collected from the classroom teachers, the names of students were removed and replaced with a coded number in order to maintain confidentiality. Finally, the data from these nominations was coded and entered into the computer.

Implementation. Phase two consisted of the implementation of the TIMI assessment process. Approval from the Office of Human Subjects, Weber State University, was obtained. Administrative approval from the appropriate school districts was obtained for the participation of school personnel and students used in the pilot study. Parental consent forms were sent to parents, by the school districts. Only participants who returned the parental consent forms, or whose parents or care-givers spoke personally or through a translator with the researcher, were be allowed to participate in the assessment process. Data from the TIMI assessments from each of the participating schools was coded and entered into the computer.

The results from the nominations (Phase one) and the TIMI assessments (Phase two) were compared to see how the students nominated in Phase one compared to the students nominated in Phase two. The results from the Ogden School District and Jordan School District TIMI assessments were also compared with the data which had been received from the Office of Education, Office for Civil Rights, Washington, DC., as well as the statistics on previous TIMI conducted. Comparisons of data were made by using Excel and Quattro Pro software programs at the researcher's residence in Ogden, Utah. A frequency count was made to compare the numbers of students reported using the TIMI assessment to show whether a modified referral system such as TIMI resulted in increased referrals. The data also was analyzed to find out which teachers were more proficient in identifying culturally diverse gifted/talented students.

Copies of the raw data, along with interpretations were either hand-carried or mailed to the principals, as well as the individual teachers at the participating elementary schools. Raw data, as well as interpretations of scores, were mailed to all of the parents who requested the results of the study. The interpretations were translated into Spanish for Hispanic parents. Copies of the letters, interpretations of scores and the Spanish translations are attached as Appendices J, K, L, M, and N.

Data Analysis and Evaluation Plan

The data obtained from this research was used as recommendations for possible changes in the acceptance criteria for admittance to gifted and talented programs for under-represented culturally diverse students. The data was obtained from a pilot study included classroom teacher nominations of culturally diverse gifted and potentially gifted students to gifted and talented programs. It also included nominations made through the use of the TIMI assessment process. Additional data was obtained from the Department of Education, Office of Civil Rights. The data was analyzed using Excel and Quattro Pro software programs at the researcher's residence in Ogden, Utah.

Four tables furnish demographic information on minority enrollments in gifted and talented programs. Table 1 gives information which was obtained from the Department of Education, Office for Civil Rights (OCR) in Washington D.C. showing white and non-white total Utah school enrollment and white and non-white Utah enrollment in gifted and talented programs. In addition, Table 1 shows the Ogden School District and the Jordan School District white and non-white populations and their minority enrollments in gifted and talented programs. The Ogden School District and the Jordan School District populations were derived from demographic information on the schools participating in the study.

Table 1
Demographics

	Number in Population	Number of Non-White	Number of White	Percent Mobility	Percent Free/Red. Lunch	Percent G&T to Pop.	Percent Non-white	Percent White	Source
United States									
total pop.	45228526	15920441	29308085				0.35	0.65	U.S. Dept. of Ed. (Nat. Cen. Ed., 1997)
national G & T pop., elem.	2826783	557442	2269341				0.19	0.81	U.S. Dept. of Ed. (Nat. Cen. Ed., 1997)
percent G & T to total pop.						0.06	0.04	0.08	teacher nomination, project, 3/98
Utah									
total pop.	501732	47598	454134		0.28		0.09	0.91	Utah State Off. Ed. (Fall Enroll., 1996)
gifted/talented pop.	17537	1278	16259				0.08	0.92	Utah State Off. Ed. (Fall Enroll., 1996)
percent G & T to total pop.						0.035	0.03	0.036	teacher nomination, project, 3/98
Jordan School District									
total pop. tested	129	39	90				0.29	0.71	TIMI test data
gifted/talented pop. of test group	45	12	33				0.27	0.73	teacher nomination, project, 3/98
district pop.	73180	5302	67878		0.26		0.08	0.92	Jordan School Dist., Asst. Super., 6/98
district g & t pop. gr. 1-6	680	9	671						Jordan School Dist., Asst. Super., 6/98
percent G & T to total pop.						.01	.002	.01	teacher nomination, project, 3/98
School C	585	181	404	0.55	0.48		0.31	0.69	Jordan School Dist., Site Coord., 6/98
School D	645	168	477	0.4	0.49		0.26	0.74	Jordan School Dist., Site Coord., 6/98
School E	637	369	268	0.84	0.92		0.58	0.42	Jordan School Dist., Site Coord., 6/98
School F	650	72	578	0.72	0.43		0.11	0.89	Jordan School Dist., Site Coord., 6/98
Ave. of tested schools:	**629**	**198**	**432**	**0.6275**	**0.58**		**0.315**	**0.685**	
Ogden School District									
total pop. tested	70	46	24				0.66	0.34	TIMI test data
gifted/talented pop. of test group	5	3	2				0.6	0.4	teacher nomination, project, 3/98
district pop.	12800	4284	8516	0.33	21		0.34	0.66	Utah State Off. of Ed. 1996
district gifted & talented pop.							0.11	0.89	info. fr. U.S. Dept. of Ed. 31-May-97
percent G & T to total pop.						.19	–	–	Ogden School Dist, G&T coord., 6/98
School B	881	621	260	0.498	60		0.7	0.3	OCS, Data Systems, 4-16-98
School A	616	529	87	0.497	60		0.859	0.14	OCS, Data Systems, 4-16-98
Ave. of tested schools:	**748.5**	**575**	**173.5**	**0.498**	**60**		**0.7819**	**0.22**	

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Table 2 shows the numbers of referrals made to gifted and talented programs by classroom teachers in the schools which were used in the pilot study. The information in Table 2 was obtained from the data gathered in the nomination forms filled out by the classroom teachers.

Table 3a shows the number of gifted nominated students (GNOM) who scored either 7 or 8 with the TIMI assessment instrument. This information was obtained from the results of the TIMI assessment process.

Table 3b shows the number of non-nominated students (NNOM) who scored either 7 or 8 with the TIMI assessment instrument. This information was obtained from the results of the TIMI assessment process.

Table 4 gives criteria for establishing the validity of a Multiple Intelligences Theory based assessment instrument. This information was obtained from Gardner (1991a, 1993a, 1995) and Kornhaber (1997).

Table 2
Gifted Nominated (GNOM) & Non-Nominated (NNOM) Students

	Nom. Pop. Percent	Total	Total Non-White	Total White	% GNOM Non-White	% GNOM White	Nom. Ling/Log-Math Non-White	Nom. Ling/Log-Math White	Nom. Other Intel. Non-White	Nom. Other Intel. White	Nom. Ling/Log-Math/Other Intel. Non-White	Nom. Ling/Log-Math /Other Intel. White
Total pop.		199	85	114	.43	.57						
Gifted Nom.	.25	50	15	35	.28	.66						
Non-Nom.	.75	149	70	79	.47	.53						
Jordan Total Pop.		129	39	90	.30	.70						
Gifted Nom.	.35	45	12	33	.27	.73	7	12	5	13	1	7
Non-Nom.	.65	84	27	57	.32	.68						
Ogden Total Pop.		70	46	24	.66	.34						
Gifted Nom.	.07	5	3	2	.60	.40	3	2				
Non.Nom.	.93	65	43	22	.66	.34						
Total GNOM							10	14	5	13	1	7

Table 3a
TIMI Linguistic/Logical-Mathematics Scores for Non-White and White Gifted Nominated (GNOM) Students

TIMI SCORE	Linguistics Non-White	Logical-Mathematics Non-White	Linguistics White	Logical-Mathematics White
Students scoring 8	0	1	0	2
Students scoring 7	3	1	1	7
Total	3 (.06%)	2 (.04%)	1 (.02%)	9 (.18%)

Population = 50 (GNOM Non-White = 16, GNOM White = 34)

Table 3b
TIMI Linguistic/Logical-Mathematics Scores for Non-White and White Non-Nominated (NNOM) Students

TIMI SCORE	Linguistics Non-White	Logical-Mathematics Non-White	Linguistics White	Logical-Mathematics White
Students scoring 8	0	0	0	2
Students scoring 7	3	7	1	7
Total	3 (.02%)	7 (.05%)	1 (.01%)	9 (.06%)

Population = 149 (NNOM Non-White = 69, NNOM White = 80)

Table 4
Multiple Intelligences Assessment Criteria

Source	Process	TIMI Yes	TIMI Incomplete	TIMI No	Comments
Gardner, 1993a, p. 10 (Kornhaber, specific condition #2)	intelligence fair instrument			x	paper/pencil
Gardner, 1991a, p. 28	many assessments, many occasions, over time			x	does not observe
Gardner, 1993a, p. 7	solve problem			x	no problem solving
Gardner, 1993a, p. 7	fashion product			x	no product fashioned
Gardner, 1995, p. 202 (Kornhaber, specific condition #3)	participation in cultural activity on more than casual basis; degrees of expertise identified			x	no activity,measurement of expertise
Gardner, 1993a, p. 7	contains cultural value			x	contains cultural bias
Kornhaber, 1997, pp. 29-30	1. Specific: extend beyond linguistic, logical-mathematics and spatial		x*		no product fashioned
Kornhaber, 1997, pp. 29-30	2. Specific: intelligence fair			x	paper/pencil
Kornhaber, 1997, pp. 29-30	3. Specific: domain based		x*		needs task - story &picture
Kornhaber, 1997, pp. 29-30	1. General: students understand task		x*		*no "task"
Kornhaber, 1997, pp. 29-30	2. General: encouraged to do best work			n.a.	none required
Kornhaber, 1997, pp. 29-30	3. General: observers adequately trained			n.a.	none required
Kornhaber, 1997, pp. 29-30	4. General: clear scoring procedures	x			
Kornhaber, 1997, pp. 29-30	5. General: observer's judgments reliable			n.a.	no observations made

* The condition is partially met.

Five additional tables give statistical information compiled and analyzed by the researcher.

Table 5a shows the means of fifth grade students previously analyzed by TIMI in national studies involving more than 4,000 students.

Table 5b gives a comparison by strength of the means of these students and the means of the students tested in Ogden School District and Jordan School District.

Table 6 gives the minority population by gender and ethnicity.

Table 7 lists the descriptive statistics for the 199 students in the TIMI assessment.

Table 8 gives the results of the *t*-test, including the means of students nominated for gifted programs (GNOM) and the non-nominated students (NNOM).

FINDINGS

The Teele Inventory of Multiple Intelligences (TIMI) was designed as a "forced choice" instrument that claims to measure all seven intelligences (Teele, 1997). Because the assessment was based on Howard Gardner's Theory of Multiple Intelligences, and was designed to measure the dominance of intelligences in students, we would expect, in the gifted nominated students to perform better than the non-nominated students. Following are the procedures that were followed, the analyses performed, and the findings that were generated.

The TIMI contains assessment measures for seven intelligences. The total score for the assessment is 28 and this score is distributed through the seven intelligences measured. The lowest possible score in any intelligence is zero (0) and the highest possible score in any intelligence is eight (8). For the purposes of this study, scores of 7 or 8 were considered "strong" or "high" scores. According to the developer of TIMI, any score above six on the day of the assessment could be labeled a "dominant strength" (S. Teele, personal communication, February 2, 1998). The TIMI seven intelligences mean scores vary by grade level. Table 5a contains the mean scores from four states with a range of schools from all Anglo rural schools to high minority urban schools, for fifth-graders:

Table 5a
TIMI 5th Grade Means - 4,000 Population from Teele Data

Intelligence	Mean
Linguistic	3.4481
Logical-Mathematical	3.6556
Intrapersonal	2.9478
Spatial	4.8755
Musical	3.8589
Bodily-Kinesthetic	4.6183
Interpersonal	4.5851

Source: Teele, S., *The Multiple Intelligences School, 1994*

Table 5b gives a comparison by strength of means of the Teele population and the means of the students tested in Ogden School District and Jordan School District.

Table 5b
Comparison of Intelligences by Order of Strongest Preference

TIMI 5th Gr. 4,000 pop.	TIMI Ogden/Jordan 5th Gr. - 199 pop.
Spatial	Spatial
Bodily-Kinesthetic	Bodily-Kinesthetic
Interpersonal	Logical-Mathematical
Musical	Interpersonal
Logical-Mathematical	Linguistic
Linguistic	Musical
Intrapersonal	Intrapersonal

Source: Teele, S., *The Multiple Intelligences School, 1994* and TIMI test data, Utah, 3/98

The first step in the assessment process was to find out whether the scores of TIMI assessments of gifted nominated students would exceed the scores of the non-nominated population. The total assessed population was 199 fifth grade students. The sample size for nominations for gifted and talented programs was fifty students. The sample size for non-nominated participants was 149 students.

The nominations of gifted students, which were made by the classroom teachers, were compiled. A total of fifty students, representing 25% of the total population, were nominated. Sixteen students, representing 8% of the total population, were ethnic minorities. The balance of the thirty-four students, representing 17% of the total population, were Caucasian. In reviewing the data, the researcher found that 100% of the teachers making nominations for the gifted and talented programs had listed "academic excellence" in the areas of linguistics and/or mathematical-logical as the reason(s) for selection to the programs. The researcher looked at these two intelligences in the TIMI assessment in order to identify any possible matches between teacher nominations for gifted and talented programs and the TIMI assessment scores.

The researcher used scores of 7 and 8 to identify strong scores in either linguistic or logical-mathematical intelligences, among the gifted and talented nominated students. These two intelligences were selected because they matched the stated reasons teachers gave for nominating students for gifted and talented programs. These students were identified as Gifted Nominated (GNOM) students. The results of this identification were

three ethnic minority students, all Hispanic, received scores of 7 in linguistics intelligence. One of these students scored 8 in logical-mathematics; another ethnic minority student (Oriental) scored 7 in logical-mathematics. A total of four ethnic minority students scored either 7 or 8 in linguistics or logical-mathematics; resulting in an ethnic minority representation of 1% of the total population in these two areas. One Caucasian student scored 7 in linguistics and nine Caucasian students scored 7 or 8 in logical-mathematics, which represented 5% of the total population for these two intelligences. Table 6 represents the Ogden and Jordan School District populations by ethnicity.

Table 6
Male/Female Population by Ethnicity

Ethnicity	Female	Male	Total
Black/African-American	5	1	6
Caucasian	65	49	114
Hispanic/Spanish	34	35	69
American Indian	4	0	4
Oriental	1	4	5
Polynesian	1	0	1
Total	110	89	199

Forty-six (.92) of the gifted nominated (GNOM) students scored six or above in one or more intelligences. One hundred thirty-six (.925) of the non-nominated (NNOM) students scored six or above in one or more intelligences.

The TIMI assessment resulted in continuous scores for the 199 students in the sample population. Descriptive statistics for the entire population of 199 fifth-grade students were obtained for all seven intelligences scored with the TIMI assessment. These statistics, including mean, standard error of measurement, and standard deviation, are listed below in table 7:

Table 7
Descriptive Statistics - 199 Students in TIMI Assessment

Intelligence	Mean	Standard Error of Measurement	Standard Deviation
Linguistics	3.9	0.111	1.576
Logical-Mathematical	4.445	0.133	1.880
Intrapersonal	2.73	0.103	1.462
Spatial	4.66	0.120	1.703
Musical	3.565	0.128	1.806
Bodily-Kinesthetic	4.625	0.099	1.401
Interpersonal	4.075	0.111	1.566

A *t*-test was performed on the means of the gifted nominated (GNOM) and the non-nominated (NNOM) students. The *t*-Test is performed to find out the difference between the means of samples. In determining whether to perform a *t*-Test, the researcher wanted to find out the probability of the sample mean appearing due to random sampling fluctuation. The mean of TIMI assessments of gifted nominated (GNOM) students exceeded the means of the not nominated (NNOM) population in linguistics, logical-

mathematical, intrapersonal, and bodily-kinesthetic intelligences. The means of TIMI assessments of GNOM students were lower than the means of NNOM students in spatial, musical and interpersonal intelligences. However, in doing the t-test, the researcher found that in each of the seven intelligences tested the level of significance was less than the t Critical one tail. Table 8 represents the results of the t-test.

Table 8
***t* Test of Means of Gifted Nominated (GNOM) and Non-Nominated (NNOM) Students**

Intelligence	GNOM Mean	NNOM Mean	df	*t*	*t* Critical one-tail
Linguistics	4.02	3.87	84	0.571	1.66
Logical-math	4.74	4.37	78	1.157	1.66
Intrapersonal	2.76	2.70	81	0.226	1.66
Spatial	4.50	4.74	67	-0.739	1.67
Musical	3.10	3.69	96	-2.20	1.66
Bodily-Kinesthetic	4.84	4.56	197	1.23	1.65
Interpersonal	4.04	4.07	101	-0.12	1.66

The researcher was operating under the assumption that students nominated for gifted and talented programs (GNOM) would score higher than students not nominated for gifted programs (NNOM), therefore, one tailed t-tests were conducted. The results of these tests were statistically insignificant; therefore, we can conclude that the differences in populations means can be attributed to chance (random sampling fluctuation). Musical intelligence was found to be significant; however, the reverse of the hypothesis occurred

and the not nominated students (NNOM) out-performed the gifted nominated (GNOM) students. Since this occurred because of extreme variances in scores of NNOM students, it did not affect the results of the study.

DISCUSSION of RESULTS

The primary focus of this research has been to determine if a multiple intelligences instrument, the Teele Inventory of Multiple Intelligences (TIMI) could enhance equity by identifying a statistically significant greater number of potentially gifted and talented culturally diverse students for participation in gifted and talented programs than a traditional form of identification (teacher nomination). An ancillary objective has been to validate the TIMI assessment instrument for use in identifying the seven intelligences that the TIMI purports to identify and measure.

The classroom teachers nominated twenty-five percent (25%) of the population as gifted and talented during Phase I of the study. Eight percent (8%) of these nominated students were ethnic minorities. Phase II of the study used the TIMI assessment instrument to identify strengths in intelligences in the population.

The TIMI was chosen for use in this project because it was a forced choice inventory, which did not require observer participation. It was designed with Howard Gardner's theory of multiple intelligences as its theoretical underpinning. Because the test was designed to measure the dominance of intelligences in students (Teele, 1995), the researcher expected it to differentiate between gifted nominated students (GNOM) and non-nominated students (NNOM). We would expect the GNOM students to perform better than the NNOM students.

The question to be answered by the research study was whether TIMI could identify culturally diverse students for gifted and talented programs, and whether these nominations would exceed the number of teacher nominations. TIMI did not identify significant numbers of culturally diverse, non-white students for gifted and talented programs, as had been expected by the researcher. In comparing the means, the researcher found no significance between the students nominated for gifted and talented programs and students not nominated for these programs. The researcher found that the top two intelligences (spatial and bodily-kinesthetic) identified by the TIMI assessment for the entire population of students tested were the same as those identified by Teele in more than 4,000 assessments (Teele, 1995). The lowest scored assessment (intrapersonal intelligence) was also the same as the Teele assessment.

Meaning of Results

It was anticipated, because of the in-service training conducted and the hand-outs furnished describing traits of gifted children, that a large sample of culturally diverse children would be nominated by the elementary teachers. A satisfactory proportion of the population was nominated; however, most of these nominations were from only a few of the teachers. Twenty-two teachers participated in the study. Sixteen teachers made nominations and their mean age was 41. One younger teacher, in her mid-twenties nominated five students for the gifted and talented program, as part of the study. Another teacher, also in her mid-twenties, gave names of previously nominated students; however,

this teacher did not use the nomination form. Three male teachers participated in the program. All of them were in their early forties. Two of them nominated one student each and the third male teacher nominated two students. Generally, more mature female teachers made nominations without the researcher making follow-up visits. No statistics were run on the teacher demographics. All of the teachers received the same background information on TIMI and MI assessments in order to make their nomination choices.

The teachers did nominate students who scored 7 or 8 in various intelligences on the TIMI assessment; however, these nominations were usually in linguistic and/or mathematical areas while the high TIMI scores were in other areas, such as spatial, bodily-kinesthetic, musical or interpersonal. The teachers did not usually make nominations in the areas of spatial, bodily-kinesthetic, musical or interpersonal. In some cases, students scored 2 or 3 in linguistics or logical-mathematical and scored 7 or 8 in bodily-kinesthetic, interpersonal, or spatial. In these cases, students were excelling in academic areas in which they had no identifiable interest, according to the TIMI assessment.

The Ogden School District made very few nominations of gifted and talented students. Only one Ogden School District teacher filled out the nomination form supplied by the researcher. This was the only nomination received from school B. The nomination was for an Hispanic male; the reason for nomination was "academic" and the student

scored 6 in spatial. Comments by teachers from school B during the in-service training represented negative attitudes by teachers towards students' abilities.

School A furnished several nominations; however, they were previously made nominations, from earlier in the year for the district gifted program. The teachers did not use the nomination forms supplied by the researcher. Four of these nominated students were assessed by TIMI. They included 2 Caucasian children and 2 Hispanic children. These students' TIMI assessments (interests) matched the nominations. The teachers' attitudes towards students were extremely positive.

Teachers from Jordan School District supplied the balance of the gifted nominations. Nearly half of these nominations listed areas other than academic; i.e., creativity, athleticism, leadership, drama, and musical abilities. However, most of the nominations came from only a few of the teachers. Some of the teachers made no nominations, even though other teachers reported to the researcher that they felt that students should have been nominated from these classes. The researcher telephoned the parents of these children and made personal appointments with them to assess their children. The results of these assessments were not included in the population.

Jordan teachers have, collectively, a twenty-five year history in training in identifying multiple talents through using Taylor's Multiple Talents (Taylor, Ghiselin, Wolfer, Loy, and Bourne (1964) and Guilford's Structure of Intellect (Guilford, 1977). These approaches encouraged the teachers to look beyond linguistics and mathematical-

logical intelligences in order to identify strengths in leadership, decision making and creativity. The effects of this training are reflected in the rate (35%) of gifted nominations made by the Jordan School District teachers (J. Seghini, personal communication, June 6, 1998).

The students who were nominated by teachers (GNOM) for gifted and talented programs during Phase 1 of the study did not score significantly higher on the TIMI than the non-nominated (NNOM) students. White and non-white GNOM students with scores of 7 or 8 in any intelligence represented 52% of their population. White and non-white NNOM students with scores of 7 or 8 in any intelligence represented 48% of their population. Ninety-two percent of the total population of gifted nominated (GNOM) students scored six or above in one or more intelligences. Ninety two and a half percent of the non-nominated students (NNOM) scored six or above in one or more of the intelligences. The results of this analysis show that there is no significant difference in intelligence scores between gifted nominated (GNOM) and non-nominated (NNOM) students. The results of the *t*-test showed that the gifted (GNOM) students did not out-perform the non-nominated (NNOM) students. The results were statistically insignificant, meaning the scores could have occurred randomly by chance.

Implications

Phase 1

The results of the study suggest that teachers, particularly those in Ogden School District, need more training in the identification of students' strengths in intelligences. Students process information through dominant intelligences (Teele, 1992) and schools can look at teacher methods to see whether they are reaching students via the dominant intelligences shown by the group means. Recognizing that accomplishments have been attained within cultural domains throughout the seven intelligences can be helpful to teachers. When students exhibit identifiable degrees of expertise in areas, the teacher can make a positive identification of a strength or gift. By identifying dominant intelligences (possible strengths) educators can teach students to make connections from their stronger intelligences to their less dominant intelligences in order to facilitate the learning process and strengthen understanding (Teele, 1997). Although TIMI is limited in its use as an identification tool of intelligences, it could have useful application in the identification of interests. This can have a positive affect on teachers and school systems by assisting teachers to facilitate and foster or enhance students' strengths.

Phase 2

One of the basic principles of Multiple Intelligences (MI) Theory is that students demonstrate strengths in areas besides linguistics and logical-mathematics and that these strengths need to be identifiable through performances in cultural activities on more than a

casual basis (Gardner, 1993). Degrees of expertise on performances in cultural practices or domains need to be measured. The TIMI was developed as a one-time assessment to measure "dominant intelligences." However, the research results raised questions as to whether TIMI performs under the basic principles and tenets set by Gardner (1993a). The TIMI assessment, did not go beyond identifying areas of strong interest because no tasks were performed, no problems were solved, nor were culturally valuable products fashioned (Gardner, 1993). Without these basic requirements being met, the TIMI assessment only showed interest, no matter the strength of the score. Almost half of the population could be nominated for gifted and talented programs according to the TIMI assessment.

The researcher was aware that TIMI was not designed to measure intelligences nor to designate a child as gifted. The TIMI, according to the developer (personal communication, 2 February 1998), was developed as a one-time assessment to measure strengths of intelligences. It does not perform assessments under the basic principles and tenets set by Gardner (1993a). It is possible that the high scores on the assessments were showing "strength," but the researcher was unable to verify that possibility without a second assessment instrument to measure expertise. Because the TIMI did not measure degrees of expertise, nor fulfill the other Gardner criteria, it probably only measures interest (see Table 4).

In addition to questions concerning measurements of strength of intelligence by TIMI, the assessment raised questions about possible biases in testing handicapped children and culturally diverse students. Specifically, these concern the use of Anglo physical-kinesthetic, linguistic, and musical activities. Panda bears may erase cultural identification through skin color; however, the activities do not reflect cultural values for ethnic minorities. It is the researcher's opinion that the use of Anglo oriented activities introduces cultural bias. For instance, economically disadvantaged children may not have experienced activities such as roller-blading, nor attended ballet performances. Oriental children, particularly first generation oriental children, may not have participated in American style "swing" dancing. Non-English speaking ethnic minority children may not be able to relate to reading *The Three Little Bears.*

The results of this research project positively impact Kornhaber's (1997) work in establishing criteria for conducting valid assessments in order to enhance equitable representation of culturally diverse (ethnic and lower SES students) in gifted and talented programs. The researcher agrees with Kornhaber, that if test designers want to use MI perspectives as the basis for the development of their assessment instruments, they have to follow the tenets of MI. They need to carefully construct instruments that meet the general conditions that are necessary to make reasonable inferences about students' abilities. Basic to these are: solving a problem, fashioning a product, participation in a cultural activity on more than a casual basis, have measurements for identifying degrees of

expertise, and finally, the assessment must be intelligence fair (not paper and pencil). According to these criteria, TIMI does not meet the conditions of MI.

The importance of authentic assessment instruments has also been emphasized by Gardner (1993a). According to Gardner, in this country, assessment drives instruction. The guidelines in Appendix A give the Utah standards for gifted and talented programs. Increasing culturally diverse populations in these programs can be met through MI assessment instruments; however, these instruments need to measure strengths, not "interests." Methods have to support assertions that an MI based assessment measures intelligences or strengths in domains in order to withstand the scrutiny of those who question the usefulness and integrity of MI theory.

Limitations

The researcher was unable to fully ascertain the capabilities of the students tested. They may be developmentally different from the mean in population groups identified for gifted and talented programs. A one-time assessment has built-in limitations, because MI needs many different assessments performed on many occasions. A separate assessment instrument was needed to make a full comparison of the TIMI assessments conducted in this research. This second instrument could have identified degrees of expertise in participation in cultural activities on a more than casual basis, and assessed products and problem solving abilities. The researcher was unable to use a second instrument in this study because of time constraints. It would have been equivalent to conducting an entirely

separate study in order to make this adjustment for verification of expertise. Another possiblity would have been the comparison of linguistic and logical-mathematical test scores with high interest from children in those areas.

Time constraints prevented the researcher from holding in-service training sessions with the teachers in Jordan School District. Few of the Jordan School District participating school teachers had their nomination forms prepared and the researcher was unable to begin assessments until the forms were completed. These delays could possibly have been prevented by conducting in-service training sessions in Jordan School District, instead of relying on telephone communications with principals and lead teachers. In order to obtain optimum results in the gifted nomination portion of the study,more training was needed in identifying gifted traits, as well as in becoming familiar with Multiple Intellligences (MI) Theory. The in-service training should have been conducted on several occasions. Although two teachers, one from each of the two districts, had endorsements in gifted education, and several of the teachers from Jordan School District had experience in identification of gifted students, only one of the teachers had heard of Multiple Intelligences Theory prior to participating in the study. Intensive in-service training sessions would have helped teachers to have the necessary skills to identify strengths in intelligences besides linguistics and logical-mathematics. Time constraints also prevented the researcher from scoring the assessments at the schools or revisiting the

schools to personally give the students the results of the study and to help the teachers interpret the results of the study.

Summary

This project identified the number of culturally diverse students receiving services in gifted and talented programs in two northern Utah school districts. The method of referrals to gifted and talented programs in these two districts was by teacher identification through observation or the use of test scores. This process limited referrals to students with linguistic and/or logical-mathematical capabilities. The participants in the study were fifth grade students from lower socio-economic families. The school demographics included high rates of mobility, a high non-white population, and high rates of free or reduced lunch.

The study was conducted in two phases. Prior to conducting Phase 1 of the study, teachers were given in-service training or written training materials to help them identify gifted and talented culturally diverse students. The intent of this training was to help identify students with high abilities or intelligences other than in linguistics or logical-mathematics. In Phase 2 of the study, the researcher attempted to determine whether the Teele Inventory of Multiple Intelligences (TIMI) could identify youngsters for gifted and talented programs. An ancillary objective of the project was to determine the validity of TIMI as an assessment instrument.

The results of the study showed no significance in the difference of the means of the gifted nominated students (GNOM) and non-nominated (NNOM) students. The TIMI did not differentiate between gifted nominated students who had demonstrated strengths in linguistics and logical-mathematics through fashioning a product or solving a problem in other settings and those students who had not previously demonstrated degrees of expertise. TIMI did show reliability in a comparison of means of students in this study and means of 4,000 previously assessed students.

TIMI was compared with the standards set by Gardner (1991a, 1993a, 1995) and Kornhaber (1997) for a valid Multiple Intelligences Theory association. According to the results of this comparison, TIMI appears to measure interest, not strength of intelligence(s); therefore, it cannot be used by itself as an assessment instrument.

It is the researcher's opinion that TIMI could be useful as an indicator of interest if used in conjunction with another instrument(s). Other assessments, with valid instruments, conducted over time, would measure expertise in problem solving, fashioning products, or participating in cultural activities in intelligence fair, culturally relevant ways. However, the measurement of accomplishments should be a part of the assessment. This process would give educators opportunities to find out the levels of expertise and the levels of interest that students have within intelligences. The value of this approach is that teachers' awareness to students' individual strengths, as well as interest in subject matters

will increase. This could then result in the valid assessment of and placement of culturally diverse children to gifted and talented programs, resulting in enhanced equity.

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Appendix A

Permission Letter from Sue Teele, TIMI Developer

Dear Fellow Educator:

Thank you for your interest in the Teele Inventory of Multiple Intelligence (TIMI). I am currently conducting classroom research on instructional strategies using multiple intelligence, and am using the TIMI to study the dominant intelligences of student in each grade level.

The TIMI is being used in over 1,000 school districts throughout the nation and in six other countries. The instrument enables educators to discover quickly their students strengths no matter what the age as it has been used with individuals from the age of 2 to 82. We have completed test-retest reliability studies with over 6,000 subjects on the instrument, and are pleased to report it is statistically reliable. The TIMI can be used through the entire school. My research has indicated different dominant intelligences occur at different age levels and this has strong implications in how we teach. I have recently published an article in the National Assocation for School Principals November Bulletin on these findings.

In closing, I appreciate your interest in the Teele Inventory of Multiple Intelligences. Please share your findings with me on any data you gather while using the TIMI with your students. I strongly believe that all children can learn and succeed, and that by discovering and capitalizing on the dominant intelligences of all students we can assist them in reaching that goal.

Sincerely

Sue Teele

Dr. Sue Teele
Director, Education Extension
Director, The Renaissance Project

Appendix B

Gifted and Talented Definitions and Theories

Marland (1972) Definition

Gifted and talented children are those identified by professionally qualified persons who by virtue of outstanding abilities are capable of high performance. These are children who require differentiated educational programs and services beyond those normally provided by the regular school program in order to realize their contribution to self and society. Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas:

1. General intellectual aptitude
2. Specific academic aptitude
3. Creative or productive thinking
4. Leadership ability
5. Visual and performing arts.

(Gallagher and Gallagher, 1994).

Renzulli (1978) Definition

Giftedness consists of an interaction among three basic clusters of human traits - these clusters being above average general abilities, high levels of task commitment, and high levels of creativity. Gifted and talented children are those possessing, or capable of development of, this composite set of traits and applying them to any potentially valuable area of human performance. Children who manifest, or are capable of developing, an interaction among the three clusters require a wide variety of educational opportunities and services that are not ordinarily provided through regular instructional programs (Gallagher & Gallagher, 1994).

Gardner (1983, 1997) Theory and Definition of Intelligence

The theory of multiple intelligences considers that there are eight distinctive types of intellectual behavior; linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, sense of others (interpersonal), sense of self (intrapersonal), and naturalist (the ability to draw on aspects of the natural world to solve problems or fashion products) (Gardner in press, Kornhaber, 1997). An intelligence is a biological and psychological potential; that potential is capable of being realized to a greater or lesser extent as a consequence of the experiential, cultural and motivational factors that affect a person (Gardner, 1995). Gardner (as cited in Kornhaber, 1997) stated that a gifted youngster is one who advances rapidly through a domain of knowledge, due to strength(s) in her intelligences and to opportunities in the environment to develop them.

Appendix C

Modified Referral Systems

A. Achievement tests:

Cognitive Abilities Tests - Thorndike & Hagern (1983). - gives scores on verbal, quantitative and nonverbal reasoning.

Differential Aptitude Tests - Bennett, G., Seashore, H., & Wesman, A. (1963). *Differential aptitude tests.* New York: Psychological Corporation. - gives scores on verbal, quantitative and nonverbal reasoning.

Otis-Lennon Mental Ability Test - gives but one score, cannot be differentiated, and does not appriase high-level thinking skills well (Hagen, 1980)

Kaufman Assessment Battery for Children (K-ABC) - Kaufman, A. (1984). K-ABC and giftedness. *Roeper Review, 7*(2), 83-88.

B. Case study approach:

Baldin, A. (1973, March). *Identifying the disadvantaged.* Paper presented at the First National Conference on the Disadvantaged Gifted, Ventura, CA.

Gowan, J., Demos, G., & Torrance, E. (Eds.) (1967). *Creativity: Its educational implications.* New York: John Wiley & Sons.

C. Creativity tests:

Torrance Tests for Creative Thinking. *Torrance Tests of Creative Thinking: Norms-technical manual.* Princeton, NJ: Personnel Press.

D. Visual and performing arts:

Peer nominations. Kavet, H., & Smith, W. (1980) Identification of gifted and talented students in the performing arts. *G/C/T, 14,* 18-20.

Appendix D

Teele Inventory of Multiple Intelligences Answer Sheet

THE TEELE INVENTORY OF MULTIPLE INTELLIGENCES

NAME: _____ SCHOOL: _____

DATE: _____ TEACHER: _____ GRADE: ____

SEX: M F (Circle) AGE: _____ ETHNICITY _____ SES _____

ANSWER SHEET

	A	B		A	B
1.			15.		
2.			16.		
3.			17.		
4.			18.		
5.			19.		
6.			20.		
7.			21.		
8.			22.		
9.			23.		
10.			24.		
11.			25.		
12.			26.		
13.			27.		
14.			28.		

TOTALS							
	1. LINGUISTIC	2. LOGICAL-MATHEMATICAL	3. INTRAPERSONAL	4. SPATIAL	5. MUSICAL	6. BODILY-KINESTHETIC	7. INTERPERSONAL

DOMINANT INTELLIGENCES

1. _____ 2. _____ 3. _____ 4. _____

Appendix E

Handout for In-Service Training

TITLE: An Investigation of the Problem of Identification in the Under-Representation of Culturally Diverse Students in Gifted and Talented Programs in Utah Schools

DESCRIPTION OF THE STUDY: The major issue to be addressed by this pilot study is whether there is an under-representation of culturally diverse gifted students in the gifted and talented programs in elementary schools in Ogden School District and Jordan School District. The pilot study will use the Teele Inventory of Multiple Intelligences (TIMI), developed by Dr. Sue Teele, University of California, Riverside. This inventory was developed as a result of an educational application of Howard Gardner's Theory of Multiple Intelligences. The TIMI assessment process, developed by Teele (1995), uses Gardner's theory of multiple intelligences as the overall conceptual framework.

The purpose of this study is not to suggest that there is a need for a distinct and totally different program which should be designed for culturally diverse gifted students. It is intended to show the importance of identification, curriculum planning, and evaluation to the culturally diverse student. These facets of a gifted program need to be recognized in order to enhance the abilities of the culturally diverse gifted students and to ensure the achievement of their highest potential in society.

MULTIPLE INTELLIGENCES THEORY: Dr. Howard Gardner, Professor of Education at Harvard University, developed the Theory of Multiple Intelligences in 1983 in which he stated that all individuals are capable of at least seven different methods of processing information (Teele, 1997). The most recent version of Gardner's theory of multiple intelligences asserts that each individual possesses at least eight relatively autonomous "intelligences": linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intra personal, and naturalist (the ability to draw on aspects of the natural world to solve problems or fashion products) (Gardner in press, Kornhaber, 1997). Each individual possesses all eight intelligences but in different degrees. Although Gardner has now (1998), identified eight intelligences, the TIMI addresses seven of these: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, and intra personal.

Intelligences are "psychobiological potentials" which are available to all unimpaired human beings at birth to process different kinds of information (Gardner, 1983, 1995; Kornhaber, 1997). Over time, children's intelligences develop to process and to produce the forms of information (or "symbol systems") available in their intelligences in order to solve problems or to create products that are valued within one or more cultural settings (Kornhaber, 1997).

According to Gardner, culturally valued products and problem-solving occur within domains. Domains are any activities in which individuals participate on more than a casual basis and in which degrees of expertise can be identified and nurtured (Gardner, 1995). For example, in American culture, we could identify domains as car repair, marketing, ballet, rap, geometry, and journalism. By employing media and materials of these domains, diverse intelligences are developed and meaningfully assessed. By contrast, traditional testings in traditional school settings use primarily the linguistic and logical mathematical faculties (Gardner, 1991). According to Gardner, a gifted youngster is one who advances rapidly through a domain of knowledge, due to strength(s) in his/her intelligences and to opportunities in the environment to develop them (Gardner, 1993).

THE TEELE INVENTORY OF MULTIPLE INTELLIGENCES (TIMI): According to Dr. Sue Teele, the developer of TIMI, identification of intelligences can assist in providing an educational system that enables all students to achieve at a pace they can handle, assure them positive reinforcement and allow them to reach their fullest potential. Dr. Teele also stated that methodologies should be implemented that reach all students and honor their diversity. This inventory will assist teachers in identifying their students' dominant intelligences in order to assist them in providing methodologies that reach all seven intelligences (Teele, 1997).

THE IDENTIFICATION PROCESS: The pilot study is to be conducted in four elementary schools in each of the Ogden and Jordan School Districts, for a total of eight schools. The dependent variable will be the currently existing number of referrals of culturally diverse gifted or potentially gifted students to gifted and talented programs in Ogden School District and Jordan School District. The research results will be compared with the dependent variable to find out whether a non-traditional identification method; i.e., the Teele Inventory of Multiple Intelligences (TIMI), will increase the number of referrals of culturally diverse gifted or potentially gifted students to gifted and talented programs in Ogden and Jordan School Districts, Utah. The observations in the study will be collected in the winter of 1998. The data obtained from this research will be used as recommendations for possible changes in the acceptance criteria for admittance to gifted and talented programs for under-represented culturally diverse students.

The TIMI assessment process will be implemented in a regular classroom setting. No teacher training is required because the assessment process will be conducted by the researcher. To increase the authenticity of the TIMI process in identifying the strengths of students in school settings, the inventory should be given in a relaxed environment that allows individuals to carefully make a forced choice

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selection. To motivate the participant to do his or her best, the participants will be told that there are no right or wrong answers. The inventory simply identifies the strengths or dominant intelligences each participant possesses. Directions will be read verbally. The assessment does not require extensive reading by participants. Fifty-six numbered pictures of panda bears will be presented and each participant will be given eight opportunities to select each of the seven intelligences. The total classroom time required will be approximately thirty to forty-five minutes (Teele, 1992).

SCORING: According to Gardner (1991), children should be assessed by observing them on many occasions over time as they are engaged in domain-relevant tasks. He also stated that children should not be assessed primarily through paper-and-pencil tests; rather, they should be allowed to demonstrate their abilities using more "intelligence-fair" media and materials. For example, to assess spatial ability, they could be asked to make a design using building blocks; for musical ability, they could be asked to sing a song, dance, or make up a tune (Gardner, 1991). According to the developer of TIMI, Dr. Sue Teele, the TIMI is not designed to measure intelligences nor to designate a child as gifted (S. Teele, personal communication, February 2, 1998). The TIMI simply shows the most dominant intelligence on the day the research is conducted. Furthermore, this intelligence has been shown to change based on what occurs on the test day. However, students have one or two intelligences which remain dominant, and this is back up by her test-retest statistical analyses. Dr. Teele, has requested the following notes be added to the results of the TIMI assessments used in this study:

(1) One or two strengths are usually dominant; however, this pertains only to the day the test was given. Reliability tests show that these strengths are often dominant; however, many factors can affect the assessment process.

(2) Strengths on the TIMI at or above the number "6" may be labeled as "gifted" in an intelligence, for the purpose of making comparisons in this study. However, the operationalized term "gifted" used in this pilot study is not an identification of giftedness. The term "gifted" is simply being used as an identification of strengths on the day the TIMI was administered.

(3) The TIMI was developed to be administered as a one-time assessment to measure strengths of intelligences. The TIMI inventory was not developed to measure giftedness. The results of the TIMI inventory will be used to find out whether students scoring at or above the numer "6" in dominant intelligences match previous nominations of students made through other methods, to existing school district programs for gifted and talented students. TIMI results will also be used to ascertain whether identifications of students for gifted and talented programs will increase through the use of a non-traditional identification method.

CONFIDENTIALITY: Subjects participating in the study will be from the classrooms selected by the school district. Students' names will be blocked out from existing nomination forms for gifted and talented programs as well as from the TIMI answer sheets. They will be identified by coded number in order to maintain confidentiality. Parental permission will be obtained for student participation.

References

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Appendix F

Gifted Characeristics

Looking for Children Who May be Gifted (Clark, 1988)

In the classroom does the child

Ask a lot of questions?
Show lot of interest in progress?
Have lots of information on many things?
Want to know why or how something is so?
Become unusually upset at injustices?
Seem interested and concerned about social or political problems?
Often have a better reason than you do for not doing what you want done?
Refuse to drill on spelling, math facts, flash cards, or handwriting?
Criticize others for dumb ideas?
Become impatient if work is not "perfect"?
Seem to be a loner?
Seem bored and often have nothing to do?
Complete only part of an assignment or project and then take off in a new direction?
Stick to a subject long after the class has gone on to other things?
Seem restless, out of seat often?
Daydream?
Seem to understand easily?
Like solving puzzles and problems?
Have his or her own idea about how something should be done? And stay with it?
Talk a lot?
Love metaphors and abstract ideas?
Love debating issues?

This child may be showing giftedness cognitively.

Does the child

Try to do things in different, unusual, imaginative ways?
Have a really zany sense of humor?
Enjoy new routines or spontaneous activities?
Love variety and novelty?
Create problems with no apparent solutions? And enjoy asking you to solve them?
Love controversial and unusual questions?
Have a vivid imagination?
Seem never to proceed sequentially?

This child may be showing giftedness creatively.

Does the child

Organize and lead group activities? Sometimes take over?
Enjoy taking risks?
Seem cocky, self assured?
Enjoy decision making Stay with that decision?
Synthesize ideas and information from a lot of different sources?

This child may be showing giftedness through leadership ability.

Does the child

Seem to pick up skills in the arts (music, dance, drama, painting, etc.) without instruction?
Invent new techniques? Experiment?
See minute detail in products or performances?
Have high sensory sensitivity?

This child may be showing giftedness through visual or performing arts ability.

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Appendix G

Nomination Form

NOMINATION FORM

Referring person:_____ **Title:**_____ **Date:**_____

School: _____ **Grade (if teacher):**_____

Gender: **M** **F** **(Circle)** **No. years in teaching profession:** _____

Total classroom population by gender: **# males** _____ **# females:** _____

Studend identification number _____

Gender: **M** **F** **(Circle)** **Ethnicity:** _____ **SES:** _____

Grade in school: _____

Student's interests:

_____

_____

Learning style: _____

Rate of learning: _____

Motivation: _____

Work habits: _____

_____

Personality traits: _____

_____

Please state your reason(s) for nominating this student:_____

_____

Method(s) used in nominating the student: standardized test results: yes___ no___

observations: yes ___ no ___ **non traditional method: yes ___ no ___**

other: yes ___ no ___ **comments:** _____

Appendix H

Parental Consent Form (English)

INFORMED CONSENT AUTHORIZATION

DATE: _____

NAME: _____
(student)

PARENT/REPRESENTATIVE: _____

SCHOOL: _____

SUBJECT OF PROJECT: This project involves a pilot study concerning the problem of identification in the under-representation of culturally diverse students in gifted and talented programs in Utah schools. This school has been chosen because of the high percentage of minority enrollment. The study will use the TIMI assessment process. This process measures intelligences in a non-traditional method. The process content is briefly described below:

Children will be given a booklet containing pictures of panda bears performing various activities, such as reading, running, singing, etc. They will be asked to think about which picture is most like them. They will then select which picture is most like them by putting a check in the appropriate column.

No procedures are experimental. The pilot study is a duplication of studies which have been conducted in many areas of the United States, and seven other countries over the past seven years.

TIME: The pilot study will be conducted during the first months of February and March, 1998. The total time each child will be involved in the study will be between thirty and forty-five minutes.

BENEFITS: According to Dr. Sue Teele of the University of California, Riverside who developed the Teele Inventory of Multiple Intelligences, there are different dominant intelligences at different age levels. This finding has critical ramifications in establishing what and how we teach and when we need to emphasize certain intelligences in our teaching methodologies in order to reach all students (Teele, 1997).

RISKS TO SUBJECTS: None.

CONFIDENTIALITY: Students will be identified by student identification number.

FINANCIAL BENEFITS: Participants will receive no financial benefits.

COSTS TO STUDENTS: None.

FINDINGS: Results of the pilot study will be made available to parents of participating students upon request.

NUMBER OF STUDENTS INVOLVED IN THE STUDY: Every student in the classroom will be used in the study. The only students who will be excluded from the study are those whose parents/representatives do not sign the informed consent authorization.

PARTICIPATION REQUIREMENTS: There is no requirement for students to participate in this study. Participation is entirely voluntary. A student may discontinue participation at any time without any penalty.

CONTACT: Valere McFarland, Primary Researcher (801) 476-3063

Forrest Crawford, Committee Chair (801) 626-7420
Dept. of Education, Weber State University

I agree to have my child, _____, participate in a pilot study using the TIMI assessment process at _____, Utah. The study is part of the requirements for a master of education degree at Weber State University. This pilot study will be conducted by Valere McFarland, primary researcher. The study will be conducted between February and March, 1998.

_____ _____
(Signature) (Date)

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Appendix I

Parental Consent Form (Spanish)

Autorización para participar en el Estudio Guía

Fecha: _____

Nombre del estudiante: _____

Nombre del padre o representante: _____

Escuela: _____

TEMA DEL PROYECTO: Este proyecto es un estudio guía acerca del problema de identificación sobre la poca representación de los estudiantes de culturas diferentes en los programas para los muy inteligentes y talentosos en las escuelas de Utah. Esta escuela fué elejida porque tiene alistado un gran porsentaje de minorias. Este estudio usará el proceso de evaluacion llamado TIMI. El proceso úsa metodos diferentes y no tradicionales para estimar inteligencias. El contenido del proceso esta brevemente delineado abajo:

> Se les dará a los niños un folleto con figuras de un oso panda Haciendo actividades diferentes como: leyendo, corriendo, cantando, ect. Se les pedirá de pensar cual de las figuras se parece más a ellos. Los niños tienen que poner una marca en la figura elegida, sobre la columna correcta.

Las procedimientos no son experimental. Este estudio guía es una duplicación de estudios que fueron hechos en los ultimos siete años, en muchos lugares de los Estados Unidos y otros siete paises.

Duración del proyecto: este estudio guía será conducido durante los meses de febrero y marzo, 1998. El tiempo total en que cada niño participará en el estudio será de los 30 a los 45 minutos.

Ventajas: el Dr. Sue Teele de la Universidad de California, Riverside que desarrollo el metodo Teele, Inventory of Multiple Intelligences, dice que hay diferentes inteligencias dominantes en cada nivel de edad. Estos desarrollos tienen ramificaciones criticas en el establecimiento de que y como enseñamos y cuando tenemos que poner énfasis sobre ciertas inteligencias para poder alcanzar a todos los estudiantes. (Teele, 1997).

Confidencialidád: los estudiantes serán identificados solamente por un número clave. **(No se usará ningun nombre).**

Beneficio Financiero: ninguno.

Resultados: Los resultados del estudio guía serán disponibles para los padres de los niños participantes.

Número de estudiantes que van a participar en el estudio: Todos los estudiantes de la clase. Los unicos que no van a participar van a ser los que no traen el permiso firmado por los padres o tutor legal.

Requisitos para participar en el estudio: ninguno. Toda participación es voluntaria. El estudiante puede terminar su participación en cualquier momento.

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Contacto:	Valere McFarland, Investigador	(801) 476-3063
	Forrest Crawford, Presidente del Comite Departamento de Educacion, Weber State University	(801) 626-7420

Yo consiento que mi hijo/a _____ participe en el estudio guia que usa el

metodo de evaluacion TIMIen _____, Utah. Este estudio es parte de los requisitos para el Master de Educaciòn en Weber State University. Este esudio guìa serà conducido por Valere McFarland, investigador. Este estudio tendrà lugar entre febrero y marzo, 1998.

_____ _____
Firma Fecha

,'or favor note: Si usted no quiere que si hijo/a sea examinado, firme abajo y debuelva este papel a la escuela de su nifio.

_____ _____
Firma Fecha

Appendix J

Parental Assessment Letter

6193 South 2175 East
Ogden, UT 84403

May 9, 1998

Dear Parent:

I recently assessed your child's areas of interest as part of a research project for my Master of Education degree. The results of this research, which was conducted by using the Teele Inventory of Multiple Intelligence (TIMI), are enclosed. The TIMI assessment identifies interests. It does not identify strengths, nor does it measure giftedness. These attributes can only be determined after many observations, in many different ways and by using many different assessment methods and instruments. The most reliable of these are parent and teacher observations. However, TIMI is valuable because it has proven to be reliable. If your child were tested again in a week, or two or three, or even several months from now, he or she would likely receive the same assessment score. Another area of importance is that when interests are nurtured in the proper way, they often become strengths, because they are the areas of intelligence where the child best processes information.

The value to you as a parent in knowing the scores, is that they can help you to understand how your child processes information. Because individuals process information differently, they use different intelligences to understand and make connections. For example, when children show high interests in an area, it may mean that they also have strengths in that area. If they are strong spatially, they see pictures instead of words. In order to help them to learn to spell, they can draw a picture of the word or concept they need to learn to spell. The child then writes the correct spelling of the word within the picture. Whenever the child hears the word, he or she visualizes a picture of the word, with the correct spelling of the word inside the picture. Bodily-kinesthetic children can learn to spell by creating the words with their bodies. Musical children can process the spelling of the words through jingles, songs, clapping their hands or moving to rhythm while they spell the words. You can work with your child in his or her areas of interest to provide opportunities to strengthen his or her understanding.

I am enclosing a hand-cut that you can use to interpret the score. If you have any questions, please call me at (801) 476-3063. Thank you very much. It was a pleasure to work with your child.

Sincerely,

Valere McFarland

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Appendix K

Educator Assessment Letter

6193 South 2175 East
Ogden, UT 84403

May 9, 1998

Dear Educator:

I recently assessed areas of interest in seven intelligences for you and your students as part of a research project for my Master of Education degree. The raw data results of this research, which was conducted by using the Teele Inventory of Multiple Intelligence (TIMI), are enclosed. A complete report, which will give the statistical analyses from local and national comparisons, will be furnished to your principal within the next few weeks. This report will also give the analysis of the study results on identifications of ethnically diverse students for possible inclusion in gifted and talented programs. These identifications were made by teachers, using traditional or non-traditional methods of identification. The study will show whether any matches occur between areas identified as gifts and talents by teachers and areas of strong interest identified by the TIMI assessment. I have now forwarded all parental requests for information directly to the parents who made those requests. These requests were made either in writing on the parental consent forms or through telephone conversations directly with me.

The TIMI assessment identifies interests. It does not identify strengths, nor does it measure giftedness. These attributes can only be determined after many observations, in many different ways and by using many different assessment methods and instruments. The most reliable of these are parent and teacher observations. However, TIMI is valuable because it has proven to be reliable. If your students were tested again in a week, or two or three, or even several months from now, they would likely receive the same assessment scores. Another area of importance is that when interests are nurtured in the proper way, they often become strengths, because they are the areas of intelligence where the child best processes information.

The value to you as an educator in knowing the scores, is that they can help you to understand how your students process information. Because individuals process information differently, they use different intelligences to understand and make connections. For example, when children show high interests in areas, it may mean that they also have strengths in those areas. If they are strong spatially, they see pictures instead of words. In order to help them to learn to spell, they can draw a picture of the word or concept they need to learn to spell. These children then write the correct spelling of the word within the picture. Whenever the children hear the word, they can visualize a picture of the word, with the correct spelling of the word inside the picture. Bodily-kinesthetic children can learn to spell by creating the words with their bodies. Musical children can process the spelling of the words through jingles, songs, clapping their hands or moving to rhythm while they spell the words. You can work with your students in their areas of interest to provide opportunities to strengthen their understanding. Another possible area of help to you as an educator, is being able to compare your personal areas of interest with your students' areas of interest. This can help you to adjust your own teaching styles to better meet students' needs.

I am enclosing a hand-out that you can use to interpret the scores. This hand-out has been translated into Spanish for your convenience in working with Spanish speaking students and parents. The original hand-out describing TIMI, which was mailed to your principal at the beginning of the project, contains a brief list of books and articles on multiple intelligences. These books and articles give many examples of effective methods and techniques which can be used to integrate the theory of multiple intelligences into your classroom. I will be happy to furnish you with a more extensive reading list of books or articles upon request. If you have any questions, please call me at (801) 476-3063.

Thank you again for adjusting your classroom time and for assisting me with this project. It was a pleasure to work with you and your students.

Sincerely,

Valere McFarland

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Appendix L

Principal Assessment Letter

6193 South 2175 East
Ogden, UT 84403

May 9, 1998

Dear Principal:

Enclosed are the raw data results of my study on multiple intelligences which was conducted recently in your school. I have also enclosed results addressed to individual teachers. Would you kindly give them to the fifth grade teachers who participated in the study?

I will soon finish the report which contains the statistical results. As soon as it has been completed, I will send your copy to you.

I appreciate very much the cooperation that I received from you and your school. If you have any questions, please do not hesitate to call me.

Sincerely,

Valere McFarland

Appendix M

TIMI Interpretation of Scores (Spanish Translation)

Entender los resultados

Es muy util tener informacion sobre cada una de las siete inteligencias para poder comprender los puntos de enfasis en las inteligencias dominantes que han sido identificadas en el estudio. Hay caracteristicas muy distintas en cada una de ellas que afectan los metodos de ensenar y los metodos de evaluacion.

Los estudiantes *linguisticos*, o sea los que se expresan mejor con palabras u oralmente, tienen un gran desarrollo de abilidades auditivas, les gusta leer, escribir y tienen buena memoria para recordarse nombres, fechas, y lugares. Tambien tienen un buen repertorio de vocabulario, usan bien el lenguaje y pueden deletrear palabras sin dificultad.

A los estudiantes con *logica-matematica* les gusta explorar modelos de combinaciones geometricas y actividades de secuencias. Les gusta la matematica, experimentar y examinar cosas que no entienden, resolver problemas y usar logica.

Los estudiantes *intrapersonales* prefieren sus mundos privados, les gusta estar solos, y conocen sus propias fuerzas, debilidades, y sentimientos. Tienen autoconfianza, son idependiantes, y se motivan a si mismos para estudiar independientemente. Responden frecuentemente con fuertes opiniones sobre temas polemicos, y casi siempre marchan contra la corriente.

Estudiantes *espaciales*, o sea que se relacionan con el espacio, son artisticos, les gustan los mapas, diagramas, y piensan en figuras e imagines. Responden positivamente a las peliculas, fotos, y otras cosas visuales. Pueden pensar con imagenes claras, resolven rompecabezas y problemas artisticos.

Los estudiantes *musicales* son muy sensitivos a los sonidos del ambiente, les gusta la musica y prefieren escucharla cuando estudian o leen. Aprecian el ritmo, sonido, y timbre, y frecuentemente cantan a voz baja, para si mismos.

Los estudiantes *corporales- cinesteticos* usan lo que aprenden atraverso de las sensaciones fisicas, y usan sus cuerpos en modos diferentes. Ellos necesitan moverse, y actuar lo que piensan. Les gusta tocar y sentir. Responden mejor en una clase que use cosas para manipular, adonde ayan istorias de accion, actuar, simular, y actividades fisicas.

Los estudiantes *interpersonales* estan a gusto con gente, tienen muchas amistades, actividades sociales, y aprenden mejor en actividades de grupo. Estos estudiantes expresan enpatia por los sentimientos de los demas, entienden los cambios de temperamento de otros individuos, y les gustan las actividades de grupo.

Sue Teele and Associates, 1992

Appendix N

TIMI Interpretation of Scores (English)

Interpreting the Score

It is helpful to have some information about each of the seven intelligences in order to understand the strengths of the dominant intelligences that have been identified from the inventory. There are distinct characteristics in each of the itelligences that should affect teaching methodologies and assessment measures. ***Linguistic*** students have highly developed auditory skills, enjoy reading, writing, like to play word games and have a good memory for names, dates and places. They possess well developed vocabularies and use language fluently and are often able to spell words accurately and easily. ***Logical-mathematical*** students like to explore patternsand relationships and enjoy doing activities in a sequential order. They like mathematics, experiment to test things they don't understand, enjoy opportunities to problem solve and reason logically and clearly. ***Interpersonal*** students prefer their own inner world, like to be alone and are aware of their own strengths, weaknesses and inner feelings. They have a deep sense of self-confidence, independence and a srong willk, and motivate themselves to do well on independent study projects. They often respond with strong opinions when controversial topics are being discussed and prefer to "march to the beat of a different drummer." ***Spatial*** students enjoy art activities, read maps, charts and diagrams and think in images and pictures. They respond positively to movies, slides, pictures and other visual media They are able to visualize clear images when thinking about thing, enjoy doing jigsaw puzzles and solving artistic problems. ***Musical*** students are sensitive to the sounds in their environment, enjoy music and prefer listening to music when studying or reading. They appreciate pitch, rhythm and timbre and often sing songs to themselves. ***Bodily-kinesthetic*** students process knowledge through bodily sensations and use their bodies in differentiated and skilled ways. They need oportunities to move and act things out. They like to touch and feel things. They respond best in a classroom that provides manipulatives, action-packed stories, role playing, simulations, physical activities and hands-on-learning experiences. ***Interpersonal*** students enjoy being around people, have many friends, prefer social activities, and learn best by relating and participating in cooperative learning groups. These students express empathy for the feelings of others, can respond to the moods and temperament of other individuals, and enjoy participating in group activities.

Sue Teele and Associates, 1992

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Appendix O

Utah State Gifted and Talented Guidelines

R300-710 Rules for Accelerated Learning Programs
R300-710-1 Definitions
A. "Board" means the Utah State Board of Education.
B. "Programs for Gifted and Talented Students" means programs for children and youth whose superior performance or potential for accomplishment require a differentiated and challenging educational program to meet their needs in any one or more of the following areas:
(1) general intellectual;
(2) specific academic;
(3) visual or performing arts;
(4) leadership;
(5) creative, critical or productive thinking;
C. "Advanced Placement" means a cooperative educational endeavor sponsored by The College Board which serves accelerated learners who wish to pursue college-level studies while still in high school. Participating colleges grant credit or placement, or both, to students who score a grade of 3, 4, or 5 on the examination.
D. "Concurrent Enrollment" means a cooperative program between institutions of higher education and accelerated learners who enroll in one or more college courses prior to graduation from high school with successful credit earned to be applied toward full college matriculation.

R300-710-2 Authority and Purpose
A. This rule is authorized by Article X, Section 3 of the State Constitution which provides for the Board to have general control and supervision over the public schools, by Section 53A-17-112(25), U.C.A. 1953, which requires the Board to adopt rules for the expenditure of funds appropriated for accelerated learning, and by Section 53A-1-401(3), U.C.A. 1953, which permits the Board to adopt rules in accordance with its responsibilities.
B. The purpose of this rule is to specify how the state appropriation for accelerated learning programs shall be distributed.

R300-710-3 Distribution of Funds
A. Programs for the Gifted and Talented: Forty-six percent of the Accelerated Learning budget shall be allocated for Gifted and Talented Programs. Each school district shall receive its share of funds allocated for gifted and talented programs in the proportion that its number of weighted pupil units for kindergarten through grade twelve and necessarily existent small schools bears to the state total.
B. Advancement Placement Program: Thirty-six percent of the Accelerated Learning budget shall be allocated for the Advanced Placement Program. Money is allocated on the basis of this sum divided by the total number of Advanced Placement exams passed with a grade of 3 or higher by students in the public schools of Utah. This results in a fixed amount of dollars per exam passed. Each participating school district shall receive the amount of money generated by students who successfully pass the Advanced Placement Examination.
C. Concurrent Enrollment: For each school year, eighteen percent of the total Accelerated Learning budget shall be allocated to participating school districts based on each district's pro-rated amount according to the number of quarter hours of successful college credit earned by students in that district.
D. The Board shall develop uniform pupil and fiscal accounting procedures, forms, and deadlines for administering these programs.

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KEY: gifted children, advanced placement*, concurrent enrollment*
1989

Art X Sec 3
53A-17-112(25)
53A-1-401(3)

R300-711 Rules for Educational Programs for Gifted and Talented Students
R300-711-1 Definitions
A. "Board" means the Utah State Board of Education.
B. "Gifted and talented students" means children and youth whose superior performance or potential for accomplishment requires a differentiated and challenging education program to meet their needs in any one or more of the following areas:
(1) general intellectual: students with high aptitude for abstract reasoning and conceptualization, who master skills and concepts quickly, and who are exceptionally alert and observant;
(2) specific academic: students who evidence extraordinary learning ability in one or more specific disciplines;
(3) visual and performing arts: students who are consistently superior in the development of a product or performance in any of the visual and performing arts;
(4) leadership: students who emerge as leaders, and who demonstrate high ability to accomplish group goals by working with and through others;
(5) creative, critical or productive thinking: students who are highly insightful, imaginative, and innovative, and who consistently assimilate and synthesize seemingly unrelated information to create new and novel solutions for conventional tasks;
C. "Accelerated" means enabling students to move through academic programs based on their performance level.
D. "Enrichment" means classes or programs that provide greater depth and breadth of experiences and information than students would receive in traditional classes.
E. "Accelerated learning programs" means programs for the gifted and talented students concurrent enrollment, and the College Board Advanced Placement Program.
F. "Programs for gifted and talented students" means differentiated and challenging educational programs designed to meet the needs of gifted and talented students in one or more areas identified in Section 1(B).

R300-711-2 Authority and Purpose
A. This rule is authorized by Section 53A-17-112(25), U.C.A. 1953, which authorizes the Board to adopt rules for spending state funds appropriated for accelerated learning programs, Section 53A-1-402(1), U.C.A. 1953, which authorizes the Board to adopt rules for special programs, and Section 53A-1-401(3), U.C.A. 1953, which authorizes the Board to adopt rules in accordance with its responsibilities.
B. The purpose of this rule is to specify standards and procedures for using a portion of accelerated learning program funds to develop programs and services for gifted and talented students.

R300-711-3 Program Standards
A. Appropriately qualified people shall direct and implement the district's program(s) for gifted and talented students.
B. Each district shall have a process for identifying students in one or more of the areas listed in Section 1(B) based upon at lease three assessment instruments. These instruments shall not be solely dependent upon English vocabulary or comprehensive skills and shall take into consideration abilities of culturally diverse, handicapped and underachieving students.
C. Each school district shall have a process for appropriately placing students identified as gifted and talented.

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D. Each school district shall develop and submit, to the Utah State Office of Education for review annually, a plan for educating gifted and talented students. This plan can reflect a time frame appropriate to the district. The district program shall contain provisions to:
(1) develop a written philosophy for the education of gifted and talented students that is consistent with the goals and values of the school district and community;
(2) select a district coordinator who is responsible for the program;
(3) recognize a variety of areas in which a student may be identified as gifted;
(4) provide carefully integrated, and articulated curricula throughout the district;
(5) identify and use teaching strategies that are appropriate to the learning styles and emotional needs of gifted and talented students;
(6) adopt flexible pacing at all levels and allow students to advance as they master content and skills;
(7) offer program options that reach through and beyond the normal institutional boundaries: across diciplines, across grade levels, and across levels of intelligence;
(8) provide guidance to assist students in addressing personal and interpersonal needs, in program selection, and in career and college choices;
(9) balance acceleration with enrichment activities for diverse types and degrees of intelligence;
(10) provide information regarding special services, programs, and other appropriate educational opportunities; and
(11) utilize appropriate community and private resources.
E. Provisions shall be made in the district plan for staff development and support.
F. Each district shall evaluate its program to assure accountability, assess the success of individual program elements, and determine student growth and achievement.

R300-711-4 Fiscal Standards
A. Each school district shall receive its share of funds in the proportion that the district's number of weighted pupil units for kindergarten through grade twelve and necessarily existent small schools bears to the state total.
B. Funds shall be used in any of the following areas:
(1) planning, program development, and identification of students;
(2) salaries, inservice education costs, and the costs of conferences, workshops, and other educational activities designed to enable teachers to better serve gifted and talented students;
(3) supplies, materials, and equipment to supplement and enhance the education programs for gifted and talented students.
C. Funds allocated for programs for gifted and talented students shall not be used for Advanced Placement or Concurrent Enrollment programs.
D. The Utah State Office of Education shall have fiscal and pupil accounting procedures to assess programs for gifted and talented students.

KEY: gifted children, accelerated learning*
1989

53A-17-112(5)
53A-1-402(1)
53A-1-401(3)

Jan 5, 1990

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